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The Journal of the Department of Agriculture of Victoria, Australia.

May, 1929.

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The Work of the Dairy Supervisor
Irrigation Farm Competitions at Tongala
Mastitis of Dairy Cows
Foot-rot of Sheep
Grafting and Budding of Fruit Trees
Registration of Stallions—Annual Report
Stallion Parades—1929 Time-table

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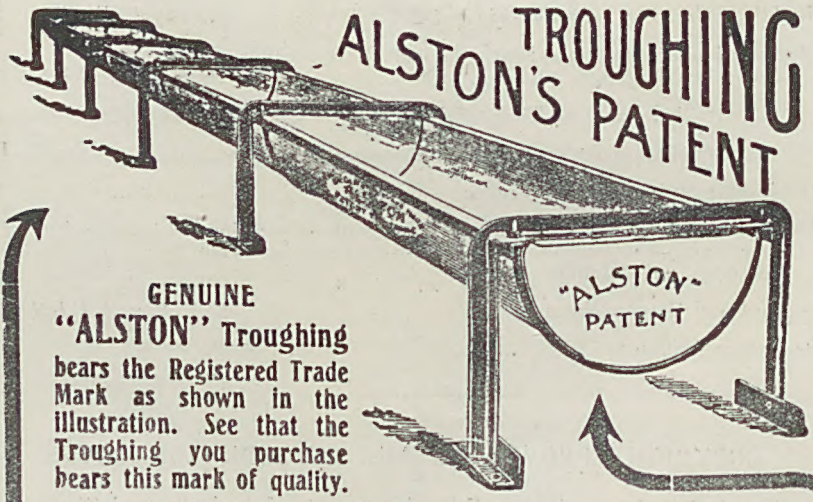

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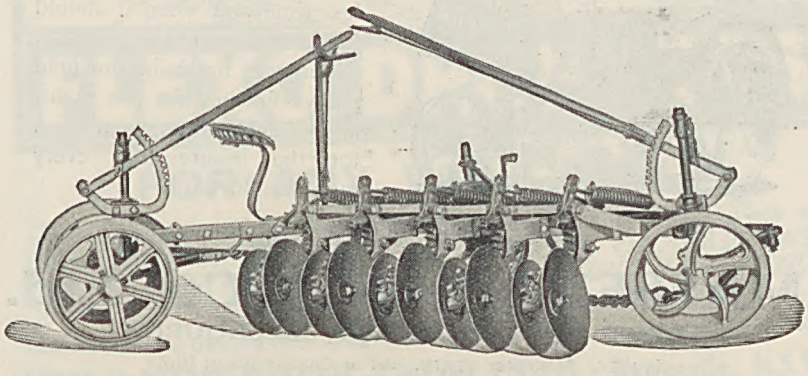

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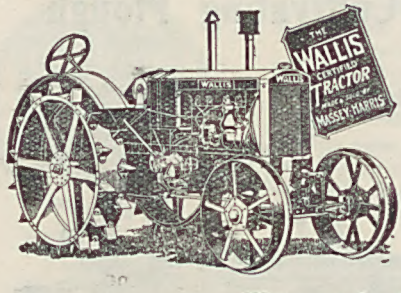

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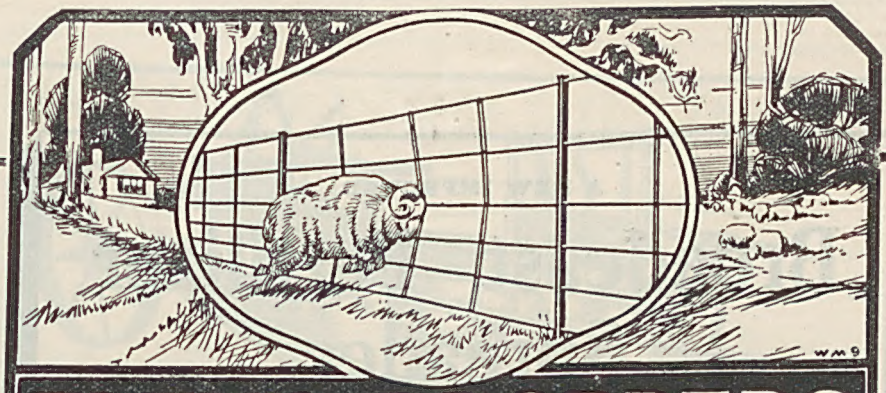

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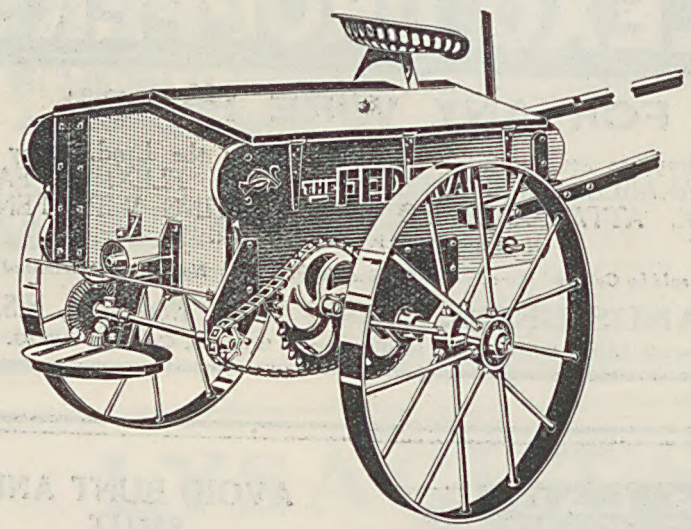

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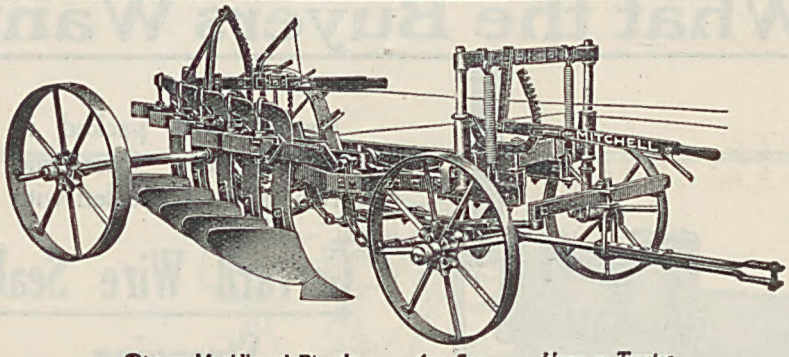

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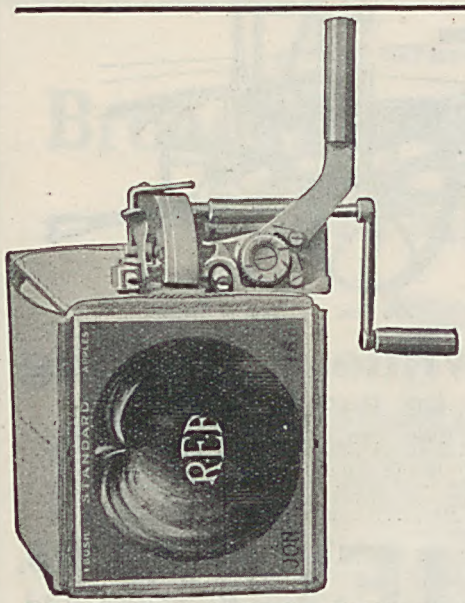

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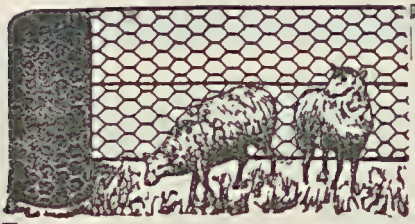

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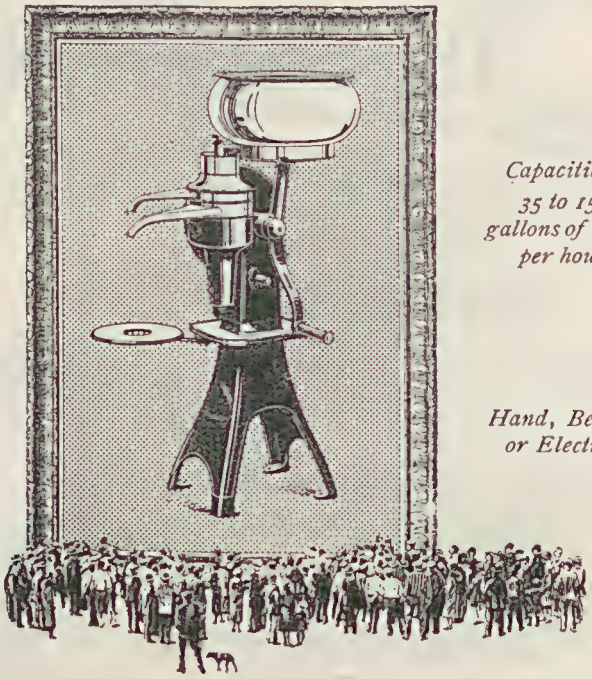

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Vol. XXVII. May, 1929. Part 5

THE WORK OF THE DAIRY SUPERVISOR.

By J. M. Kerr, Chief Dairy Supervisor.

No doubt there are people in both city and country to whom the term "Dairy Supervisor" conveys little, if any, meaning. For aught they know a Dairy Supervisor may be some new piece of dairy machinery, or a cleansing powder for dairy utensils. It may be well, therefore, to explain that a dairy supervisor is one of about eighty specially qualified officers employed by the Government, in its Department of Agriculture, to ensure as far as practicable that milk and butter sold for human consumption shall be acceptably wholesome to its consumers.

That food should be wholesome is a matter of concern to every person in the community. Some few people may be indifferent, but many would keep a watchful eye on the way such an important article of their daily diet is produced, if they only had the chance. And surely, in a civilized community, this is a consumer's right—to know the treatment to which the food (for which he proffers good money) is subjected, in the course of its production and delivery. Particularly should one have the right in case of such a readily decomposing article as milk. But in these days of specialized trades and professions, the rights of food supervision must be delegated, just as we delegate the work of its production.

The employment of a dairy supervisor by the Government, as at present, and making him responsible for proper sanitary practice on the part of milk producers and distributors means just this:—That citizens, as a community, are entrusting to one of their number, who possesses special qualifications, the performance of a necessary work which each (if it were practicable) would be doing for him or herself.

There is no doubt it is an economic arrangement—this of every man to his trade, making not only for economy but for efficiency as well. What a lot we would have to forgo if, instead of being able to devote ourselves each to a certain calling and specializing therein, as now, each

of us had to perform every act of production, manufacturing, and distribution that the housing, clothing, and feeding of a human family involves—not only grow the food and the wool and the cotton and the hides, and mine the metals, but do also the wood working, the iron working, the shearing, the butchering, the milking, the gristing, the spinning, the weaving, the tailoring, the cooking, and the thousand and one other things incidental to it all, to say nothing of the work which we now entrust to professional men, such as doctors, dentists, &c. Yet it must have been done once (within the family at any rate). It was true economy to have big families in those days, when practically all trades were of a domestic nature. It must have been very early in history when human beings first resorted to specialization of industry, and not very far from the days when Adam delved and Eve span. It would first be adopted within the family, no doubt, and later within the clan or tribe, as certain individuals sharing all the common duties began to show a special aptitude for certain work—one for one thing and another for another. It would not be long till the advantage would be recognized of letting those who were particularly proficient at certain crafts engage solely in that labour—the best at iron working, no doubt, became a blacksmith; the best at weaving, a weaver; and so on. In this way the land (to a share of which each person born has theoretically a right) became entirely abandoned by some, and for thus giving up this natural right, these special tradesmen would command recompense in primary products, in the growing of which they had had only an indirect part. Thus did specialized trades, as we know them to-day, originate, as did also the specialized professions.

That of dairy supervisor was one of the last to arrive, not that it was any less necessary than other modern professions, but because mankind was so late in discovering that both food decomposition and contagious diseases are caused by dirt-loving germs. Now, with dairy produce practically an indispensable part of the nation's food supply; with this indispensable part known to be, when unclean, a potential conveyor of disease, and with the modern impossibility of consumers (as they are now placed) doing anything in the way of dairy supervision for themselves, some form of control over dairy produce supplies is imperative; and the employment of special officers to do a necessary and truly economical work, that members of the general community cannot possibly do for themselves, is real economy of labour, and is as truly an evidence of social and industrial refinement as the much earlier delegation of horse-shoeing to the farrier, or gristing to the miller, or, in fact, in the organizing of any of the much older and better known vocations.

Of course, a dairy supervisor must be a man of special qualifications. In Victoria, it is stipulated that he must have been a dairy farmer himself for a period long enough to have enabled him to become thoroughly conversant with all phases of dairying. This experience of having passed through the "university of hard knocks" makes for sweet reasonableness on the part of the supervisor, and helps to ensure the goodwill of the majority of the supervised, and without goodwill, supervision, as we have it, could not be sustained; for it is inconceivable that any system of State-wide dairy supervision could survive, that had not the approval of the industry as a whole.

Whatever our ideals may be, there can be no thought of pushing the hygienic standard higher than the majority of those engaged in the industry are willing to comply with. But the maximum of regulation that people are willing to comply with to-day is not necessarily fixed for all time. It certainly grows as knowledge spreads, and here the State may confidently look for still further returns from its policy of accepting only highly qualified instructors as dairy supervisors.

Duties of the Supervisor.

And now for some of the duties that engage the supervisor. The Dairy Supervision Act under which he works provides for a supervisor for each municipality proclaimed. In practice each supervisor is given an area containing approximately 400 premises, this being about the number over which one man is deemed to be able to exercise effective supervision.

The supervisor's first duty is to visit the premises of every person engaged in selling milk, cream, or butter, make a thorough inspection of everything bearing on the cleanliness of the product, and in the light of his observations, report to the Chief Veterinary Inspector all pertinent details, along with a recommendation regarding a licence—for or against. If the recommendation is favorable (as it usually is), the owner's application for licence (which the Act requires shall be made every year) is granted at once. Should there be minor defects, not serious enough to warant closure, an undertaking is obtained from the owner that such will be remedied, and sale is permitted to go on meanwhile. If the irregularities are such as to constitute an injustice or menace to consumers, action is much more summary, but it is never unreasonable. It can be safely said that official action under the Dairy Supervison Act is never unjust.

If an offender is not amenable to reason, and the supervisor cannot succeed in bringing him to a sense of his responsibility as a trader in human food, the licence is, of course, definitely refused, and sale can then be continued only at the risk of prosecution. In addition to being responsible for the sanitary conditions throughout, including the cleanliness of all utensils and dairy machines, it is the duty of the supervisor to closely observe the cows for any symptoms of ill-health.

As an extra precaution against communicable disease of bovine origin, it is the practice of the supervisor to manipulate (at approximately annual intervals) the udder of every cow in use. Such diseases as tuberculosis of the udder and mastitis are detectable in this way.

A further duty of the dairy supervisor is to act promptly to prevent the sale of dairy produce from any premises wherein there has been an outbreak of infectious disease, until such time as he deems resumption safe to the public. If the supervisor did no more than has already been detailed, his employment would amply justify cost. But important as the duties so far mentioned may be, these constitute but a small part of the dairy supervisor's total usefulness, and require little more qualifications than those of an inspector of sanitation.

The Dairy Supervision Act is, however, much more than a sanitation measure. Public health must, of course always be its first consideration, but public health is no more threatened by insanitary dairying than is the whole economic position of the industry, and it has to

be conceded, by every one, that the economic soundness of Victoria's greatest primary industry is a stake worth playing for. Thus it is that, out on the farms, something more than coercion is called for in dairy supervision. It is only on the farms that the supervisor takes on his full national function. Here he becomes not only a sanitation inspector, but a guide, counsellor, and friend to many. Without "letting down" on what reforms may be absolutely necessary, he can induce the farmer to remedy many defects that may be minor from a health point of view, yet very important from a commercial or economical. The farmers left to themselves are usually very slow to adopt new ideas, till, at least, they are convinced of the necessity for change.

On farms where the cows are producing no more than 150 lb. of butter-fat each per year, the supervisor can tell the owners of farms no better in quality on which cows are producing double that amount. He can stimulate interest in herd testing, a movement which has already done wonders for its adopters in Gippsland and other parts, and which was made practicable only by the work of a dairy supervisor. There is much advice that can be given about the growing of crops and the feeding of cows which are known to be giving good results wherever practised.

A very important matter is the condition of the cream when it arrives at the factory. This depends on several things, all within the farmer's control, but perhaps not within his knowledge; whereas it is a poor supervisor who does not know about the care due to cream, and why that care gives its results. A wonderful field of usefulness lies open to the dairy supervisor in the existing possiblities of cream improvement. The condition of cream supplied to the factories for butter-making was always, of course, important, but it has taken on a still greater significance now, since Great Britain has forbidden the importation of butter containing any form of preservative. Therefore it is necessary that to-day cream be kept as fresh without preservatives as at one time it could be kept with their aid.

Keeping Cream Fresh.

Any dairy farmer really bent on supplying a choicest cream to the factory can always do so, but there is not likely to be much success in this direction if attention is not given to three things in particular.

The first is cleanliness in every operation and in every utensil through which the product passes. As far as utensils are concerned, there can be no complete cleanliness without boiling water.

Another need is cooling. Cream should always be cooled as it comes from the separator and kept down in temperature till it reaches the factory. This brings us to another important item—the length of time of keeping, or, in other words, the age of the cream. Every extra hour of age makes for a lower grade at the factory. In New Zealand no cream will be accepted as choicest, however well preserved it may be, if it is more than twenty-four hours old at time of delivery. It is hard to see how the necessary improvement in defective cream supplies is to come about, unless it is by the good offices of the dairy supervisor.

There is to my mind one great outstanding source of cream contamination—the responsibility for which the farmer shares with the factory manager, who at least ought to know better. I refer now to the badly

washed cream can. All the efforts of the supervisor on the farm will go for very little if the farmer receives his empty cream can back, as he so often does, containing milky drainings, instead of in a sterilized and bone-dry condition. This carelessness on the part of the factory manager not only ensures a waiting stock of germs for the next filling, but it brings him cumulative trouble, inasmuch as water drainings remaining in a can invariably result in rust, which can be calculated to damage any cream placed in that can in future.

One of the most difficult problems for the supervisor is to see that only perfectly clean and rust-free cream cans are used. As every farmer knows, it takes a lot of boiling water to sterilize a utensil so capacious as a cream can, and particularly when it has suffered the extra contamination of milky drainings and a hot road journey combined.

If this amount of boiling water has to be provided daily, the wood bill will be a more serious tax on the dairymen of the timberless Western District that they will care to pay. Already, and largely because of the cost of firewood, there is a disposition not to scald effectively, even the smaller utensils.

Unless the dairy farmers of the Western District can be made more prosperous, or some cheap substitute can be found for firewood, the cost of fuel threatens to be one of the greatest problems. Absence of firewood detracts considerably from the value of a dairy farm, but because allowance for this deficiency was not made in the purchase price, the supervisor has to ask himself, "Am I to overlook the necessary sterilization of utensils just because the farm returns leave no margin for firewood?" Then, again, too many of the cans in use rust with altogether too little provocation. This constitutes another heavy tax on the dairy farmer, and if the standard for export butter be raised to what might well be necessary, then the absolute soundness of cream cans will have to be insisted on, which means that the amount to be expended by the farmer on new milk cans will be prodigious. The almost equal susceptibility of more expensive buckets to rust also increases the difficulty the supervisor has in abolishing the utterly unsuitable kerosene tin.

These considerations are, of course, more economic than hygienic, but in either field (as they pertain to dairy production) the work of the dairy supervisor is justifying its specialization. The pity is that more of the State's municipalities do not adopt the principle.

FOOT-ROT OF SHEEP.

By R. J. de Courcy Talbot, B.V.Sc., Veterinary Officer.

The importance of this disease, which in recent years has been prevalent in Victoria, must become apparent to any one who considers the losses which the sheep and wool industry suffers as a result of its spread. These losses consist not only in the reduced condition, and sometimes the death of the affected animal, but also the amount of time and money which must be spent on prevention and treatment. Many serious outbreaks of the disease are due to the fact that some owners either do not, or will not, recognize that footrot is an extremely contagious disease, which may be carried and spread from paddock to paddock, or farm to farm, by affected sheep. If the contagious nature of foot-rot were recognized by all, and isolation and proper treatment of affected animals were rigidly practised, the disease would, in a short time, cease to be the menace to the industry that it is to-day. It is world-wide in its incidence, and has long been recognized as one of the most serious troubles that the sheep farmer has to contend with. In countries where flocks are small, and under the careful supervision of an experienced shepherd, early recognition of the disease, and individual treatment and isolation of affected animals is possible. In these circumstances, it seldom assumes the character of an epidemic, as it does in Australia, where with large numbers of sheep running on expansive runs early detection of affected animals is difficult.

Cause.

Foot-rot is due to a specific organism (or germ), the *bacillus necrophorus* or *necrosis bacillus*, which gains entrance into the tissues of the foot through some injury or abrasion to the horn or the skin in the vicinity of the coronet. This is always more liable to occur during wet weather, or when sheep are grazing on wet pastures as under these conditions the horn becomes soft, and is more easily injured. Mud accumulates between the toes, and when it becomes hard is capable of causing injury to the horn and the skin between the digits; this opens the way for the germ to attack the tissues. Other predisposing causes are overgrowth of horn, injuries from thorns or thistles, in fact, anything which will produce the slightest break in the horn or skin between the digits or the coronet.

For many years the contagious nature of the disease was not generally recognized, but as a result of a great deal of experimental work it is now known that animals may be affected with it simply by rubbing on the skin between the claws material obtained from the diseased feet of another animal. The discharge from affected feet contains millions of the germs which cause the disease, and, bearing this in mind, it becomes apparent why so many sheep in a flock may develop foot-rot in a comparatively short time, particularly among those whose hoofs have become softened, overgrown, and broken after weeks of grazing on moist pastures.

It is a well-known fact that the finer-woolled sheep are more susceptible to the disease than are some of the British breeds. These

latter, however, are not entirely immune, but in them the disease usually runs a very much milder course, which responds more readily to treatment.

Symptoms.

The first symptom noted is slight lameness, usually on one of the front legs, and it rapidly becomes worse. At the beginning of an outbreak, for the first two or three days only one or two sheep will be affected, but in a short time fresh cases will be noticed every day. If the lame animals are examined, it will be found that the tissue immediately above the cleft of the hoof, either at the back or the front, is swollen and painful, the inflammation spreads rapidly, and in a little while the skin breaks down, and a foul-smelling purulent discharge is emitted. This will be found to be penetrating beneath the horny tissue. By this time the animal will be extremely lame, and if only the front feet are affected, it will crawl about on its knees; if the hind feet are also affected, it lies down quietly.

As the disease progresses, and if no treatment is adopted, the horn becomes under-run with pus, and commences to break down; in some cases it actually peels off. The necrotic process may even invade the ligaments and joints of the leg. At this stage large quantities of pus, broken-down tissue and horn are discharged. The smell is most offensive and quite characteristic of the disease; an experienced sheepman has no need to examine a sheep suffering from foot-rot to make a diagnosis, the smell of brokendown horn indicates to him what the trouble is.

If treatment is not adopted, it will not be long before the wool becomes fouled with the discharge, and this in hot weather will soon be struck by flies, the maggot adding further to the suffering of the unfortunate animal.

As the inflammatory processes advance, the animal runs a high temperature, it loses its appetite, becomes emanciated, and death may occur.

Treatment.

As with all other diseases, treatment to be effective must be adopted as early as possible. Cases taken early are fairly easy to cure, but the longer they are left the more tedious and uncertain is the treatment. First separate all healthy sheep from those affected, and put them into a different paddock from the one in which the disease occurred. Those affected should be carefully examined, and divided into two lots, viz., those which have the disease in a fairly mild form, and which will probably recover after two or three treatments, and those which are badly affected, and will require individual treatment over a period. These latter should be kept in a small paddock close at hand.

Many different treatments have been recommended for the disease, and for some of them remarkable success is claimed. Whatever is used, however, it must be remembered that the fundamental and essential principle upon which all successful treatments are based is, first, a thorough trimming of the hoof, followed by some antiseptic treatment which will destroy the causal organism, and assist healing of the affected parts.

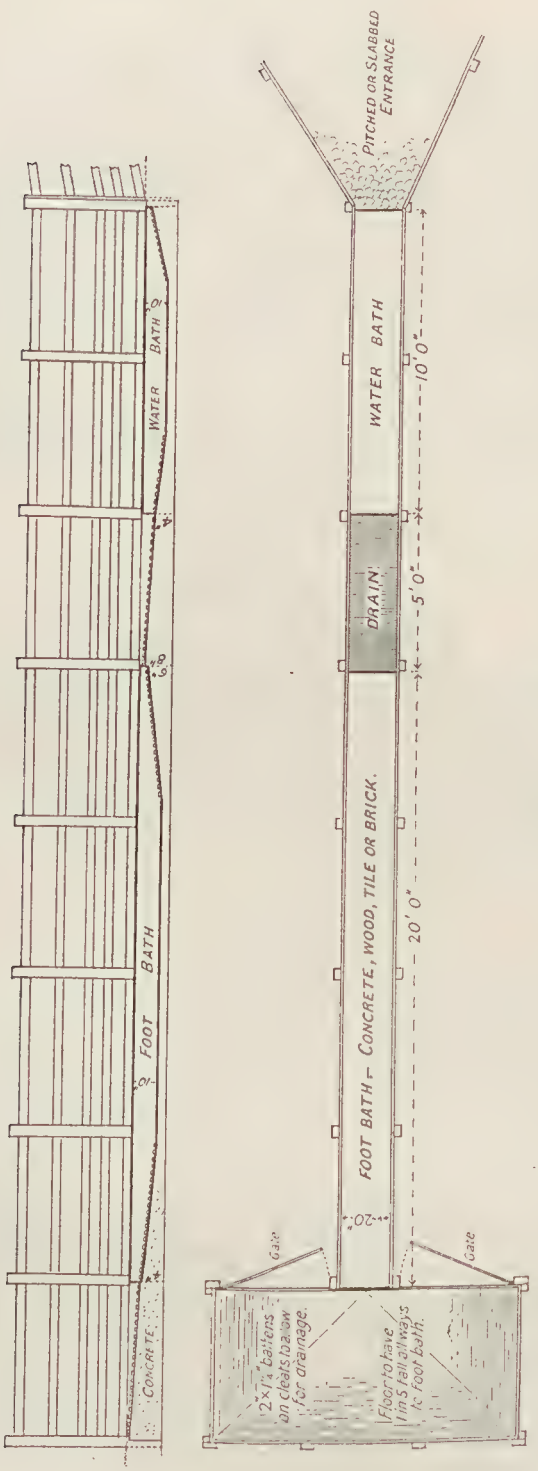
On small properties where only a few sheep have the disease, each animal should be treated individually. The feet must first of all be thoroughly cleansed from all mud, &c., and then the diseased and loose horn and tissue carefully cut away. Abscesses should be opened and drained of pus, and growths of proud flesh cut away. This is no easy job, but for the treatment to be effective, it must be rigidly carried out. All hoof parings and dead tissue should be either burnt or buried. After the foot has been cleaned up in this way, a dressing should be applied. The most effective is a paste prepared as follows:—Stir into 1 quart of warm Stockholm tar 2 oz. of finely powdered bluestone and 1 tablespoonful of lysol. An application of this mixture should be put on to the trimmed and prepared foot with a brush or rag swab. If a liquid dressing be preferred, then either of the following will be found effective:—(*a*) 6 oz. of bluestone and 4 oz. of lysol mixed with 1 gallon of water, or (*b*) sodium arsenite 3 oz., lysol, 4 oz., water 1 gallon. Whichever of these mixtures is used, it will be necessary to hold the sheep in such a way that its feet will remain immersed for a few minutes. In the preparation of any mixture containing bluestone a wooden or an earthenware vessel should be used, as the copper contained in the bluestone will corrode any metal container. The treatment should be repeated daily if possible, until a cure is effected. In slight cases, three or four dressings are usually sufficient. After dressing, the sheep should be placed on clean pastures where the feet will not become soiled.

On large properties where numbers of sheep must be treated, the use of a foot-bath will be necessary although for serious cases individual treatment, as suggested above, is most satisfactory. The plan of a suitable foot-bath is shown on page 265. It consists, as is seen, of a long race divided into three parts; the first division is a water bath 10 feet long, in which the feet are washed to get rid of mud, dust, &c. The sheep then pass over a draining division, 5 feet long, and then into the bath proper which is 20 feet long, and contains the solution for treatment. From this the animals pass out into a draining pen. This pen may be constructed with two divisions each capable of holding about 20 sheep. The animals are run from the bath into one of these pens until it is full, and held there while the other is being filled; in this way the sheep will be retained in the pen for at least 5 minutes.

The trough should be constructed of wood, concrete, brick, or tile (iron is unsuitable because many of the solutions used corrode metal), and should be from 8 to 10 inches deep, 20 inches wide at the top with sides sloping to a width of 8 inches at the bottom. When required for use, it should be filled to a depth of 4 inches with the solution prepared for use.

After the feet have been trimmed, &c., the sheep should be passed slowly through the bath, care being taken that they do not walk through on three legs, or rush too quickly, or lie down. After passing through they should be kept in the draining pen for some time, and then placed in as clean a pasture as possible and on no account into the paddock where the disease occurred.

The two essentials in the treatment and prevention of foot-rot are first an absolute understanding of the fact that the disease is highly contagious; and, secondly, the paring and preparation of the hoof, so that the dressing to be used may exert the fullest possible antiseptic action on the diseased parts.



Plan of Foot-bath.

Prevention.

Before any newly purchased sheep are added to the flock, they should be carefully examined for any evidence of the disease, and even if this cannot be found, they should, wherever possible, be kept in isolation for some little time. In wet seasons avoid over-stocking, and keep the sheep on high ground, or else on well-drained pastures.

On properties where foot-rot occurs periodically, it will be found that the incidence of the disease may be appreciably reduced if the animals are passed through a foot-bath at short intervals (every ten days or so) throughout the winter and spring. In some properties the lick troughs are placed on concrete floors about 14 inches by 10 inches, with a 5-inch raised edge all around. At the season of the year when foot-rot is prevalent, the floor is filled with the bluestone or arsenic mixture to a depth of 2 inches. By this device the sheep soak their feet every time they approach the trough for lick.

A paddock in which an outbreak of the disease has occurred should be kept free of stock, and placed under cultivation; failing this, an opportunity for a good burn off should be awaited.

PASTURE TOP-DRESSING.

Results at Warncoort.

The pasture top-dressing experiments conducted by the Department of Agriculture at Warncoort, near Colac, have now been in operation for four years, and the results show definitely that the carrying capacity of pastures in this district can be markedly increased by the application of superphosphate at the rate of from 1 to 2 cwt. per acre. The tests, which are located on the farm of Mr. W. J. Dennis, comprise a series of small demonstration plots treated with various combinations of fertilizers, and three bulk plots, each 1 acre in area. On these larger plots, dressings of superphosphate, at the respective rates of 1 cwt. and 2 cwt., are applied, and the yields compared with the yield from an unmanured plot.

This year's results have been very conclusive in that they have shown that a substantial increase in the quantity of herbage grown on this pasture land can be obtained by the application of fertilizers.

Last year the yield of grass hay on the unmanured plot was 12.5 cwt. per acre. Where 1 cwt. of superphosphate had been applied, the yield was increased to 21.5 cwt. per acre, while with a dressing of 2 cwt. of superphosphate per acre the yield was still further increased to 29.3 cwt. per acre.

Apart from the increased carrying capacity of the top-dressed pasture, as indicated by the increased growth, there was a notable improvement in the quality of the herbage where superphosphate had been applied. For example, a botanical analysis of the herbage on the unmanured plot showed 74 per cent. of grasses, no clovers, and 26 per cent. of weeds. Where 1 cwt. of superphosphate per acre had been applied, the analysis showed 60 per cent. of grasses, 34 per cent. of clovers, and 6 per cent. of weeds. With 2 cwt. of superphosphate per acre, the percentages were:—Grasses 51 per cent., clovers 46 per cent., and weeds 3 per cent. Where lime had been applied, no appreciable improvement was effected, and nitrogenous fertilizers also gave no profitable response.

MASTITIS OF DAIRY COWS.

By R. N. Wardle, B.V.Sc., Veterinary Officer.

This disease, which is also known as Mammitis and as Garget, is an inflammation of the udder, and is caused by specific organisms only visible under the microscope.

It is a contagious disease, which means that the causal organism may be readily transferred from one individual to another by direct or indirect contact. In the case of mastitis, the means of infecting cows are indirect, as, for instance, by the hands of milkers, and by the cups of milking machines.

Mastitis is prevalent on dairy farms in this State, and the economic loss to the industry, if it could be computed, would show startling figures. This loss is made up by several factors. Among them may be mentioned the actual loss of milk from cows affected either permanently or temporarily; in other cases where the flow of milk does not wholly cease, the yield is of inferior quality; further, when the disease becomes acute, many animals never recover.

Mr. H. E. Albiston, M.V.Sc., in examining milk retailed in Melbourne, has frequently found it to exceed the bacterial limit per unit as laid down by by-law, simply because of the presence of large numbers of the micro-organisms of mastitis, which, in most cases, have been traced to chronic and mild cases of mastitis not recognized by the farmer.

Mastitis organisms have an important influence on the keeping qualities of milk, and the question of their effect on the health of human beings, more particularly on that of children, is certainly one to be considered.

Causes.

The cause of the disease is a micro-organism or germ, of which there are two species known by the scientific names of *Streptococcus* and *Staphylococcus*.

It is generally conceded that mastitis caused by *staphylococcus* is of a very acute form. In most instances, it is brought about by the direct introduction of the *staphylococci* into the udder by means of dirty teat syphons, or through wounds.

Mastitis caused by the *streptococcus*, however, is more common, and it is safe to say that the source of infection in an outbreak is in every instance the udder of a cow from which the organisms pass out in the milk, although the milk may appear normal.

These organisms may lodge in dirt around cow yards and milking sheds; they may be carried in dust, and are frequently present on the hair and skin of animals.

There are often contributory causes which allow the causal organism to overcome the natural resistance of the animal to infection. Among these are bruising of the udder; unnatural retention of milk when cows are stocked up, or when they are being carelessly dried off; and, finally,

the sudden change in a cow's udder that takes place when she "comes in," that is its change from a non-secreting to a secreting organ.

Mode of Infection.

Unfortunately cows may be very easily infected with the mastitis organisms.

A cow's udder is in direct communication with the outside of the animal body. When not being milked, the teat by means of muscular contraction is closed, but even then is not impervious to the entrance of germs. When milking commences there is a relaxation of the teat muscles thereby providing a more patent passage for the entrance of the disease producing germs.

In general, then, infection takes place through the teat. Infection, however, may also pass directly into the udder tissue by means of injuries and contusions caused by kicks—from man as well as other animals—by horning and by wire cuts. In these cases the infection may be caused by several different organisms, but nevertheless quite capable of being transferred to other cows.

Once the causal organism gains entrance to the udder, it finds in this organ an ideal medium in which to develop and multiply.

Symptoms and Diagnosis.

Most dairy farmers are conversant with the symptoms of mastitis, and readily diagnose it, more especially when it has reached the stage where the milk has undergone extreme change. Then one can scarcely help recognizing it. What is of greater moment is ability to recognize the onset of the disease, and to realize the fact that even mild cases are contagious, and are apt to turn into chronic cases very soon after the most noticeable sympton—the abnormal appearance of the milk—appears.

A great deal depends on the virulence or strength of the causal organism, but usually at the onset a change is noticed in one or more quarters; they may become inflamed, hot to the touch, swollen, and painful.

The cow may "go off" its feed, and investigation will show that the temperature is above normal—a cow's normal temperature is from 100° to 102° Fahr.

The milk secretion is diminished and soon changes in appearance; small clots appear in it, perhaps it is tinged with blood, or it may appear watery. Later on the clotted material increases, and the whole of the secretion may become thick and purulent or pus-like.

After the disease has progressed for some time, structural alterations take place; the affected quarters become thickened with fibrous tissue throughout their substance, and often series of knotted cords can be felt.

Naturally, when the secretion becomes thick as a result of pus formation and clotting, greater difficulty is experienced in "stripping out" this discharge, and the condition may then bring about the formation of abscesses which will point and break to the outside.

In some cases in which constitutional disturbances—high fever and loss of appetite—occur at the outset, the udder becomes highly inflamed

and blackish in appearance and though not more than one quarter may be affected at first, ere long the trouble spreads to perhaps all four quarters.

This signifies that gangrene has occurred, and the affected portions of the udder may die and drop off. Such cases may terminate fatally, and are due to infection by *staphylococci.*

All cases of mastitis should be treated as contagious. Even if the alteration in the milk be only slight, vigilance and care must not be relaxed; these mild cases of a chronic nature are occasionally treated lightly by the dairy farmer. Probably all that is noticed is a slight swelling of the udder, or part thereof, lasting only a few hours, and accompanied by a slight watery appearance of the milk, in which may appear small clots—a condition to which the term stringy milk is given.

These symptoms may disappear by the time of the next milking, and perhaps it will be thought that the cow has recovered. But this is not always so, and frequently the milk remains infective. After a time the tissue of the quarter undergoes alteration, and, on manual examination, distinct thickening can often be felt, and the quarter may become light in milk secretion. From time to time in these chronic cases the milk may appear stringy or watery, but in such a mild way that any change is overlooked. A serious recurrence is likely to occur at the next calving.

It is necessary for all dairy farmers to recognize that this mild form is one of contagious mastitis, and to treat it as seriously as the more acute form. Only by a bacteriological examination can it be ascertained whether milk is non-infective. Such an examination will be made at the laboratory of the Veterinary Institute under the direction of Mr. H. E. Albiston, M.V.Sc.

At this laboratory, it has been found that milk taken from cows which have been affected with mastitis, and whose udders have undergone fibrous thickening, although appearing normal, is invariably charged wth the *streptococcus* of mastitis.

Treatment.

Treatment presents many difficulties. If one could only tell at the onset whether complete resolution was likely, one would naturally be justified in going to considerable trouble to attain this. Unfortunately, many apparently slight cases prove obstinate, and even when eventually the milk may appear normal to the eye once more, the udder has become nodular or fibrosed, and complete resolution has not taken place. In such instances, mastitis organisms may still be present in the apparently normal milk.

However, most dairy farmers will try to cure their animals so that some instructions for this are necessary.

Firstly, it is advisable to isolate, where practicable, the affected cows, and the time to carry this out, and also the time to commence treatment, is right at the onset of the complaint.

When first any abnormality of a quarter, or of the secretion, is noticed, commence treatment. Do not wait to see how it will be at the next milking; such a delay may mean the difference between a speedy cure and a protracted case or a non-cure.

If taken in this very early period, rubbing the quarter affected with some stimulant twice a day, in combination with the practice of "stripping out" the quarter as many times as can be carried out under the conditions, may be all that is necessary to effect a cure, and prevent the case reaching the stage where pus forms and the milk becomes thick.

Agents chiefly used are kerosene, kerosene and oil, turpentine and oil, or turpentine liniment, and some of the proprietary remedies that are advertised for this purpose.

If any temperature develops and the cow appears upset in general health, a good saline drench should be given. An effective drench can be easily made from the following ingredients:—Epsom salts, 14 to 16 oz.; treacle, 1 cupful; thin oatmeal gruel, 1 quart.

If the case advances in severity the treatment must be continued. Fomenting of the udder may be practised. This is best carried out by placing a dish of hot water beneath the udder. A large cloth should be dipped in the water, and then applied and held to the udder. To do this is the work of two persons.

The water should be as hot as one can bear one's hand in, and may contain a little antiseptic. In order to keep the water at the right temperature, hot water should be added at intervals.

Massage and rubbing in of the lotion is advised, and the frequent stripping should be continued.

Where pus has formed to such an extent that it is difficult to evacuate it through the teat, even by the aid of a teat tube, the practice of amputating the teat at its base is sometimes practised. This operation may prevent the formation of abscesses, and will undoubtedly afford relief to the cow by allowing thick discharges to escape speedily.

Such an operation reduces the cow to a three-quartered one, but she may still give good yields. Where an owner is satisfied that a cow is finished for dairying, and wishes to fatten her for beef, the amputation of the teat can be carried out with advantage.

In those cases where abscesses develop, they may be treated by opening them when ready, and bathing and syringing them with antiseptic lotion such as lysol, one teaspoonful being allowed to 1 pint of water.

Means of Spread.

In almost all cases of outbreaks of mastitis, carelessness and ignorance on the part of the owner and attendants are the cause of spreading it from one cow to another.

The chief means of spread of the infection are as follows:—

By the hands and clothing of milkers.
By milking machines being used on affected cows.
By introduction into teats of non-sterilized instruments.
By germ-laden dust, &c., lodging on udder, especially at or about milking time.

Clean farms and herds invariably become infected by the introduction of a diseased cow, which, in the case of streptococcic mastitis, is the original source of infection whereby, by some of the above stated means, other cows become infected.

Control.

Dairy hygiene, if practised correctly, will minimize the spread of mastitis. Cleanliness in every process is essential. The milking sheds

should be well situated on high grounds, should have impervious floors, and the yard immediately adjacent to the shed should be pitched. Where a water supply can be used, both shed and yard can be cleansed by flushing. The sheds should be cleaned out regularly, and must not be used for storing bags, skins, harness, &c. White-washing and tarring should be regular practices.

Prior to milking, the udders and teats should be washed with soap and water, and then dried with a clean cloth. The hind legs must be kept clean, and the hair of the flank clipped when necessary.

Water for washing the udder should be changed frequently, and cloths should be clean. A number of cloths should be kept for this purpose, and they should be boiled daily.

A separate dish and towel should be kept for the use of milkers' hands, which should be washed immediately prior to the start of milking each cow.

Dry milking is to be preferred.

Milking machines must be kept scrupulously clean. The caustic soda method is recommended. A leaflet on this subject can be had from the Department of Agriculture.

Before affixing teat cups to the udder, each quarter should be tested by milking a little from each into a special bucket.

Never milk on to the floor.

Should a cow affected with mastitis be discovered after machines have been used on her, the hot caustic soda solution should be run through them to clean them before they are used on another cow. Immediately a case is noticed the cow should be removed from the shed until the remainder of the herd is milked. If strict isolation is impracticable, the affected cow should be brought into the yard after the healthy cows have been let out. A separate bail, preferably outside the shed, should be used for these cases, and on no account should machines be used on them. An instance has been recorded in this State where, through the use of machines on a cow affected with mastitis, a herd of 80 cows became infected to such an extent that the entire herd was ultimately turned into beef.

Where the cow is a low producer, and especially where this is combined with the fact that she is of a beef type, no time should be lost in drying her off, and fattening her. Little or no monetary loss will be incurred, and the action may prevent further infection.

During treatment of cases, all the infected milk should be collected into special containers such as petrol tins, and should be boiled before being discarded.

Cases of mastitis often occur after teat instruments are used. To prevent this happening, the instruments should be sterilized by boiling in water for ten minutes.

Finally all newly purchased cows should be isolated for a few days, or, at any rate, they should be milked last, and an examination made of their milk to see that there are no indications of mastitis.

Contagious mastitis is a notifiable disease under the Stock Diseases Act, and under the Dairy Supervision Act the sale of milk or cream from cows affected with the disease is prohibited.

IRRIGATION FARM COMPETITIONS AT TONGALA.

Report of the Judges, L. C. Bartels, B.Ag.Sc., Department of Agriculture, and E. Ryland, State Rivers and Water Supply Commission.

The Tongala Agricultural Society this year fell into line with Cohuna and Rochester Societies in promoting a farm competition, and Mr. J. Mackenzie accepted the task of organizing it. Actually there was a threefold competition, and prizes were offered for the best irrigated farm, the best paddock of lucerne, not less than 3 acres, and the best paddock of mixed pastures.

Three inspections of all farms were made by the judges, and the schedule of points used is shown below.

(1) BEST IRRIGATED FARM.

On some farms the layout was a feature; on others the cultural methods were good, and the condition and the sequence of crops very satisfactory. Several farms were noteworthy for the high class of cows carried, and for their efforts to raise the standard by herd testing. The indifference of others in this regard nullified good work in other directions. There were men who carried sheep and cows, and some who concentrated on sheep, and it was difficult to appraise their methods from a competition stand-point, because some had pure-bred sheep, and some agisted other men's sheep, while others relied on auxiliary grazing areas to supplement the grazing on their own blocks.

Some farmers made pigs or poultry a main feature; others who sold their milk had no pigs. Others again had neither pigs nor poultry. Then there were the men who were wholly satisfied with lucerne, and others who welcomed mixed pastures as the solution of their difficulties.

Not all the exhibitors had paid sufficient attention to farm buildings, or to the surroundings of their homes, but some had planted small orchards and citrus groves to supplement their incomes.

The general appreciation of herd testing and top-dressing, a development of the last few years, is very satisfactory, and the diversity of operations shows how elastic is irrigation farming.

Mr. F. W. Brose, who was awarded first place, has a block of 62 acres, of which he has been in occupation for five years. The farm has twelve main paddocks and two smaller ones of 1½ acres. Four pig paddocks occupy 1½ acres, and 2 acres is devoted to the home, a very neat garden, and outbuildings. There is a nice belt of shelter trees growing up.

The property is divided by a lane, and the paddocks are check-banked for irrigation on the border system, the banks being set diagonally in the paddocks to adapt the system to the slopes.

Mr. Brose runs 20 cows, mixed and of indifferent quality, but he has a pure-bred Jersey bull; in addition his block carried 4 calves, 3 "poddies," and 3 horses. He has concentrated on pigs, and at the time of judging his farm carried thirteen brood sows and two boars, including pure-bred Berkshires and Tamworths, and his latest purchase is a pure Duroc-Jersey boar. In five months, July to November, he sold 100 suckers at 29s. each.

He has also the nucleus of a poultry flock in 40 Black Orpington hens. There is a neat milking shed with a brick floor and clean yard attached. Milking machines are in use. The bull was kept penned in a separate yard.

The lucerne on the block (42 acres) is four and five years old. The water used last season on the block was 86 acre-feet. The farm was top-dressed in 1927 with 2 cwt, of superphosphate per acre, and last year only 1 cwt.; but the difference in results has decided Mr. Brose to revert to a 2 cwt. dressing. Two good lucerne stacks and a butt of oaten hay were in reserve.

There is an area of 13 acres of seeded pasture, 1½ acres of oats, and 1½ acres of sorghum.

The condition of Mr Stillman's farm was evidence of splendid endeavour. He has been on his block of 55 acres for two years. At the first inspection 6 acres were in mixed pasture, 1 acre under citrus, about ½ acre in oats, and the balance of the area was in lucerne in varying conditions. In the interval between inspections, some of this lucerne land was ploughed with a view to rectifying errors in grading and re-establishing it.

The dairy herd on this farm included 13 Jersey cows and 5 grades, with a Jersey bull at the head. There were also 8 pure Jersey heifers. Other stock carried included 4 horses, 2 brood sows, 100 hens, and 350 chickens. The farms is fairly well laid out—a lane gives access to all ten paddocks.

Mr. Stillman is a strong advocate of top-dressing and uses a bag of superphosphate per acre. He devotes particular attention to the watering of his lucerne, with the result that it shows uniform and vigorous growth.

Mr. G. Duck must be regarded as a successful settler—a position arrived at by sound methods. On his block of 68 acres, he has 12 acres of lucerne, and all but 5 acres of the remainder is in pasture. The lucerne is reserved for hay-making. He has used 120 acre-feet of water in a season, and top-dresses the whole farm every year with superphosphate at the rate of 200 lb. per acre.

On the block are 16 milking cows, 2 dry cows, 3 two-year-old heifers, and 10 yearlings. A Friesan bull heads the herd. By herd-testing and culling, Mr. Duck has brought his cows to a high stage of production. Last year his returns were £25 per cow, and the year before £30 per cow.

At the inspection he had 5 cross-bred sows and 1 large white Yorkshire boar, 45 young pigs, and 4 baconers. He also had a small flock of hens.

The pastures on this farm are the main feature, and in old lucerne paddocks there are areas of self-established rye-grass and white clover, which are very good.

Mr. J. Bullingham's block shows good management. He has an area of 44 acres, 33 of which are under lucerne. He has 4 acres of seeded mixed grasses and clovers, and 4 acres in natural pasture. About 30 head of stock, including 14 milking cows, were carried. Mr. Bullingham is working towards a Friesian type, and is guided by herd-test records in building up his herd. He has no pigs, but there is a small flock of poultry.

In a loamy depression he has a patch of exceptionally good lucerne, but the major portion of his block is the clay loam which is characteristic of the district. By attention to watering and manuring, all the lucerne has been brought to good condition.

Mr. Bullingham makes a good deal of lucerne hay. Some of this is used for winter feeding, and he is usually able to sell some.

Other competitors deserve mention. In fact, if in the schedule of points defined for the judges, greater value were placed on selected dairy herds, the system of cultivation, and the condition of crops, some of the competitors would have figured more prominently.

In cultivation methods, Mr. Hanslow is a guide for all to follow. The sequence of crops, the thoroughness of preparation, cultivation, and attention to watering and top-dressing enabled him to have an abundance of feed. He relies on Sudan grass as a supplement to lucerne, and oats for winter grazing.

Some of the other farmers are to be commended for their efforts to establish pure-bred herds. Messrs. Willmer and Tinning have Friesians. The herds of Messrs. Greed and Coombes include pure Jerseys. Messrs. Fuller, Meldrum, Woollard, and Whitfield combine sheep-farming and dairying, and they presented well developed blocks. Mr. Whitfield has a small flock of Border Leicester sheep.

The following table gives details of the points allotted:—

AWARDS—BEST IRRIGATED FARM.

Name of Competitor.	Layout of ground for irrigation, fencing, grading, &c.	Method of watering and condition of irrigation channels.	Absence of weeds.	Condition and quality of stock.	Out-buildings.	Care of implements.	Reserve of fodder.	Farm garden.	Total.
Maximum Points ..	**135**	**105**	**90**	**75**	**60**	**30**	**60**	**45**	**600**
F. W. Brose ..	119·5	88·5	75·5	54·5	51·5	22	51	41	503·5
J. Stillman ..	110·0	90	72	69·5	45·5	20	52	40·5	499·5
G. Duck ..	101·0	85	75	71	51·5	20·5	55	36·5	495·5
J. Bullingham ..	115·0	91	76	61·5	44·5	16·5	57	30	491·5
H. Hanslow ..	113·0	94·5	82·5	45	52·5	15·5	58·5	30	491·5
— Woollard ..	103·5	84·5	76·5	48	51	26·5	51	36·5	478·5
W. J. Tinning ..	98	83	75·5	66·5	53	14·5	51·5	25·5	467·5
G. Fuller ..	118·5	86	73·5	55	39	16·5	53·5	22·5	464·5
W. Whitfield ..	111·5	82·5	71·5	53·5	41·5	15	56	30·5	462·0
A. Meldrum ..	118·5	84	73·5	54·5	53·0	17·5	31·5	26·5	459·0
L. Moulden ..	113·5	80·5	72·5	42	37	13·5	42	20·5	421·5
L. T. Willmer ..	119	83·5	76·5	58·5	28	17	33	..	415·5
G. Baul ..	117	95·5	78·5	53	55·5	14	1	..	414·5
T. A. P. Coombes ..	107·5	53	65	60	49	13·5	49·5	9	406·5

(2) PASTURE COMPETITION.

The number of entries and the quality of the exhibits in the Tongala Pasture Competition was an encouraging response to this new venture by the Agricultural Society. It was probably the first Irrigated Pasture Competition held in Victoria, and attracted fourteen entries.

There has been a gradual development in regard to permanent irrigated pastures, following on the lead given at the Werribee Research Farm, and, without detracting from the value of lucerne, it may be said definitely that they will have an increasing importance on the dairy farms in all the irrigation districts, and their value will be greater as the various factors governing their productivity are better understood.

Some settlers disparage the pastures—particularly those who are favoured with good lucerne land. Rightly they esteem lucerne for its high yielding capacity, and by a judicious rotation of cereal crops as a complement to the lucerne, splendid results are obtained. But there are many settlers whose studied judgment is that the introduction of pastures has meant the opening of a new era for them. Mixed pastures have shown their suitability for places where lucerne does not grow well—for instance, they will flourish under wetter conditions; they are very long lived; they provide variety; they gave continuity of feed; they are most productive when heavily grazed, and thus reduce labour costs.

The several important points to be observed in regard to mixed pasture include:—

Care in establishment, so that a good strike of the various elements, particularly the valuable clovers, may be obtained. This is best assured by careful preparation of the ground, which involves a shorter or longer period of fallow. Care in grading is necessary to permit an even distribution of water.

The selection of a suitable mixture of grasses and clovers is important. The following is offered for guidance:—

Permanent rye-grass (Western District strain) ...	10 lb. per acre.
Italian rye-grass	5 „ „
Cocksfoot	5 „ „
Cow grass	2 „ „
White clover	1 „ „
Alsike clover	1 „ „
Sub. clover	1 „ „
Lucerne	1 „ „
Strawberry clover	4 oz.

Although as revealed by the competitions good results have been obtained by seeding in June and July, mid-winter is not the right time for sowing, and it is probable that these good results were obtained only because of the relatively dry winters which have been experienced. It is advisable to have the ground ready for sowing in May.

Care should be taken not to allow the grasses to dominate the young clovers. The latter will be able to assist themselves later, but they should be given a fair chance when young. If shut off from the light by the rye-grasses, they will be smothered out. Liberal manuring is very important in pasture management—in fact, one cannot dissociate the growing appreciation of pastures from the extension of top-dressing.

Many of the pastures in the Goulburn Valley represent volunteer growths of white clover, strawberry clover, and even rye-grass, which have invaded old lucerne stands. A notable example of this amongst the entries was Mr. Foley's pasture. It consisted in the main of white clover—a wonderfully dense stand which showed splendid growth at all three of the inspections. On many other farms in the Tongala district there are similar areas. White clover, often called white Dutch clover, is one of the most valuable of the clovers. It is not native to

Australia, but in this Victorian type we have a strain which has proved its adaptability to our conditions. It might be called Victorian wild white clover, but it is very different from English wild white clover. The strain here has developed under different climatic conditions, and resembles more the Lladino clover from Italy.

On Mr. Duck's farm, white clover and rye-grass are spreading everywhere. It cannot be the climate which is the cause of the failures experienced by some settlers, nor is it the soil, because Mr. Duck has not the best soil, but he waters and top-dresses regularly. He sowed Western District rye-grass and New Zealand grass, and it seems that is the explanation of why the rye-grass is spreading. In the old Western District pastures, natural selection has left the strains suited to Western District conditions, and they are more likely to succeed than are the strains imported from Europe.

Some day, from the old rye-grass pastures of our irrigation districts, somebody will reap the seed; that will be a further step ahead. There is at Cohuna a field covered with rye-grass. It was sown on a small patch of that field 30 years ago. When isolated, it made uniform growth, and proved itself to be a distinct type.

Then in the Murray Valley patches of strawberry clover are growing. Fine pastures are to be seen at Swan Hill and Cohuna, and other places. Top-dressing has given a fillip to these.

The lesson that emerges from all this is that we cannot yet appreciate what irrigated pastures will be, but every field of pasture will develop if looked after, and of the millions of seedlings which start, there will be a survival of the fittest, and very likely the twenty-year-old pasture will be less exacting in regard to moistness because therein is the greatest difference between our conditions and those of the native habitat of the grasses and clovers.

Some of the settlers pointed with pride to fine stands of meadow hay produced from their mixed grasses and clovers, but it should be understood that cutting for hay alters the relation between the different elements in a mixture, and the sole of pasture is usually much better when it is always grazed. When saved for hay, many grasses assume a tussocky habit, and the "bottom" grasses tend to be crowded out. On the other hand, plants like lucerne are favoured.

Grasses are "sweeter" when kept down, and a sub-division of pasture areas into paddocks of the right size to permit this should be adopted, otherwise there is waste. This was illustrated in many of the exhibits, and it would have been profitable to have mowed over the pasture instead of allowing the grass to dry off untouched in patches.

It is a recognized practice in older countries to harrow the pastures, and there is no doubt this would be beneficial here, if only to spread the cow droppings.

Pastures should be regularly top-dressed with superphosphate, and up to a bag per acre and more is being used by Tongala settlers. If our soils had sufficient available plant food and moisture, a different native flora would have developed.

Regular watering is necessary. Grasses will not grow under very wet conditions, nor will they survive a stewing in irrigation water on a very hot day. While they are more resistant than lucerne, every effort should be made to avoid abuses.

These points will be better appreciated as settlers acquire more experience, and it is advisable for any one who proposes to sow mixed pasture to begin with a small area and build as his experience dictates.

Mr. T. A. P. Coombes was awarded first prize in the Pasture Competition. His was a young pasture and it showed development in the period between the first and the third inspections.

The area (4½ acres) was in oats in 1927; it was ploughed in February 1928, and was worked up and sown in the beginning of June. The seed mixture sown with 1 cwt. of superphosphate was compounded as follows:—

	lb. per acre.
Perennial rye grass	... 20
Cocksfoot	... 5
Cow grass	... 2
White clover	... 2
Alsike clover	... 1
Subterranean clover	... 1

The paddock was laid out regularly on the border system with provision for drainage. The pasture was uniform, and the checkbanks well covered. Rye-grass predominated, and the clovers were somewhat repressed. Hogweed was growing throughout.

Mr. T. O. Gass had 4 acres of pasture in the competition. It was sown in July, 1927, with the Department's mixture, and 1 bag of superphosphate per acre. The top-dressing was repeated in 1928. The area was an old soiling paddock, and was broken up in 1926 for millet; the millet failed, and the ground was re-ploughed in May, and reduced to a good tilth.

This pasture showed variety and a good balance, but it had not been heavily grazed, and has assumed rather a tussocky appearance. Mr. Gass's practice was to allow his cows to graze the pasture for a short time every day, and he said the pasture favorably influenced the milk yield. His appreciation of pastures is significant, as he has for years used his lucerne as a soiling crop, and he has for a long while experimented with grasses, and is gradually extending his area of seeded pastures.

Mr. E. Watson's entry was meritorious; its area was 7½ acres. The land was in bare fallow during the summer, and was sown down at the end of May, 1928. The mixture of seeds sown with 120 lb. of superphosphate per acre was as follows:—

	lb. per acre.
Perennial rye-grass	... 15
Italian rye	... 5
Cocksfoot	... 5
Cow grass	... 3
White clover	... 2
Alsike clover	... 2
Subterranean clover	... 1

Mr. Watson waters this pasture every fortnight.

Mr. G. Duck stands out in the district as an exponent of the value of grasses and clovers for grazing dairy cattle. Fifty acres of his farm are under pasture.

His exhibit in the Pasture Competition was 9 acres in area. The paddock has irregular slopes and a depression through the centre. This detracted from the uniformity of the pasture.

It was nearly all rye-grass and white clover, and because it was a relatively large grazing unit, it was difficult to keep the pasture uniformly grazed. There was no defined lay-out for irrigation.

Before the grass was sown the land was cropped with cereals; it was ploughed after irrigation in February; worked down and rolled, and sown in May. New Zealand and Western District rye-grass together were sown at the rate of 25 lb. per acre, and white and red clover at the rate of 10 oz. of each per acre.

First a bag of manure per acre was drilled in, and the land harrowed; then the seed was broadcast, and again the ground was rolled.

A bag of superphosphate is applied every year, and in the summer the paddock is watered every ten days.

AWARDS—PASTURE PADDOCK COMPETITION.

Name.	Layout for Irrigation and Condition of Channels.	Condition of Herbage.	Uniformity of Pasture.	Variety.	Absence of Weeds.	Total.
Maximum Points	**60**	**60**	**60**	**60**	**60**	**300**
Coombes, T. A. P. ..	55	54	57·5	59	52	277.5
Gass, T.	54·5	54·5	54·0	58	53	274
Watson, E.	56	50	50·5	56.5	55	268
English, W.	54	47·5	53·0	56.5	53	264
Tinning, W. J.	53·5	49·5	51·0	52·0	53·5	259·5
Nihill, J. J.	54·5	43·5	50·5	55·5	53·0	257
Willmer, L. T. ..	55·5	44	50.5	51·5	55	256·5
Baker, F.	49·5	43	50·5	54.5	50·5	248
Duck, G.	35	51·5	54	49.5	51·5	241·5
Darwin, D.	49·5	48·5	43.5	46·5	49	237·0
Foley, C. W.	43·5	51	45	44·5	52·5	236·5
Everett, W. J. ..	38·5	46	36·5	49.0	49	219·0
Whitfield, W.	54·5	35·5	42·5	37·0	49·5	219
Makin, P.	45·5	35·5	40	42·5	44	207·5

(3) LUCERNE COMPETITION.

Very good stands of lucerne were inspected in the Lucerne Competition, but not all were shown to best advantage. It is suggested that if the competition be repeated, one inspection on a fixed day in the season would suffice.

It was pleasing to see such good stands, and to know that they demonstrate the value of the practices taught by the Department, because every exhibitor realized the value of adequate water, liberal manuring, and rotation in cutting and grazing. The lay-out of the ground and general condition of the stands showed that the preparatory work was reasonably well done.

Top-dressing is accepted now as a necessary practice, and everywhere evidence of its value is forthcoming. The tendency is to use more and more fertilizer. Fortunately, from the departmental plots at Tongala, definite information regarding manures is available. These plots demonstrate the superiority of superphosphate, and show that 100 per cent.

increase in yield is obtained by an annual dressing of 4 cwt. of superphosphate per acre. These plots also show that the density of the stand is maintained, weeds are kept out, winter growth is promoted, but one important benefit that they cannot show is the improved fodder value of top-dressed lucerne. The competitions throw light on this by affording information regarding stock carried, and the improved health of the stock.

Nearly all the lucerne inspected was grazed, and was doing well. In every case grazing was done systematically. The farms were divided into small paddocks, and eaten off in rotation. This permitted the lucerne to make good growth between grazings, and it may be stated that for lucerne this is very important, and a stand should be allowed to reach maturity once in a season.

There is no doubt that liberal manuring strengthens the lucerne, and enables it to withstand better the effects of grazing. During the dry seasons the irrigation districts of northern Victoria absorb great numbers of sheep from the drier districts of the State and the Riverina.

Mr. G. Baul, of Kyvalley, was awarded first place in the competition for an area of lucerne not less than 3 acres, and this exhibit was an illustration of the capacity of the land and a splendid demonstration of what careful management contributes in lucerne production.

On each of the three inspections in November, at the end of January, and in March, the lucerne stand looked well; it carried dense growth, and, at the first and third inspections, estimates of the probable yield of hay were 35 cwt. and 30 cwt. per acre. At the January inspection it was at an intermediate stage, but at all times it was uniform and clean, showing a vigorous growth.

The history of the paddock is as follows:—In 1923 it grew a crop of barley, and in 1924 a crop of peas. It was ploughed in October, 1924, and was in fallow for a period during which it had a dressing of 25 cwt. of lime. It was check-banked, sown in mid July, 1925, with 15 lb. of seed per acre. The seed was sown broadcast, and, after it came up, superphosphate was applied at the rate of 3 cwt. per acre. It has had at least 3 cwt. every year since, and last year it was given 4 cwt. per acre. The lucerne has not been winter scarified, but some of the lucerne fields are sown with oats during the winter.

The paddock has been grazed only. Usually the sheep are turned in when the plants are beginning to bloom, and once a year the lucerne is allowed to go to full bloom.

Mr. Baul's farm contains only 25 acres, and most of this is in lucerne. During the summer he had a small area of millet, and another small paddock bears a natural development of white clover. The lucerne is of various ages; the oldest stand was sown in 1912. The farm is divided into eleven paddocks, which permits rapid rotational grazing. On the average, 18 inches of water per annum is used, and under these conditions Mr. Baul has carried on agistment the equivalent of 320 sheep for the last six months, besides 4 cows, 1 horse, 2 calves, 12 pigs, and 140 head of poultry.

Second prize was awarded to Mr. Whitfield; although the stand showed some irregularities at the first inspection. It was presented in uniform condition later. The paddock is laid out on the border system, watering two directions, with a drain in the centre.

The lucerne was sown in 1927 without extended preparation, but it is well managed now. It is sometimes watered twice between grazings, and last year received 425 lb. of superphosphates per acre in two applications.

Mr. L. Moulden was awarded third place in the competition. On his farm of 100 acres, divided into fifteen paddocks, he has 84 acres of lucerne. He uses on the average 15 inches of water per annum, and usually waters three times for every two growths of lucerne. He top-dresses on the average at the rate of 140 lb. of superphosphate per acre per annum.

Since the first of October, 1928, he has carried on his block 1,500 sheep on agistment, and 31 bullocks for one month. In addition, he has 3 cows and 4 horses.

Mr. Moulden had two entries, and on two of the three inspections exhibit "A" was in splendid order, showing vigorous growth. This lucerne was sown in 1926. The land had previously grown lucerne, but preparatory to re-sowing it had been cropped with oats for two successive years. It was worked up in early March, cultivated till May, then graded, cultivated, and sown in June, 9 lb. of seed and 1 cwt. of superphosphate per acre being put in. Mr. Moulden usually scarifies his lucerne in late autumn, and sows oats.

AWARDS—PADDOCK OF LUCERNE, NOT LESS THAN 3 ACRES.

Name of Competitor.	Layout for Irrigation, Channels, &c.	Apparent Yield at Time of Judging.	Quality of Hay it would produce.	Uniformity.	Absence of Weeds and Disease.	Total.
Maximum Points	**60**	**60**	**60**	**60**	**60**	**300**
Baul, G.	57·5	55	57	56	57·5	283
Whitfield, W.	55	46·5	54·5	43	55	254
Moulden, L. (A Exhibit) ..	53	39	49·5	52	57	250·5
Green, M. F.	54·5	35	54	44·5	55·5	243·5
Hanslow, H.	56	32·5	44	48	57	237·5
English, W.	54·5	33·5	47	42·5	55·5	233
Moulden, L. (B Exhibit) ..	54	35	34	51·5	56	230·5
Tinning, W. J.	46	37·5	51·5	40	48	223

Correction.

On page 222 of the *Journal* for April, 1929, the heading "Loose Smut" was inadvertently omitted after the paragraph relating to Ball Smut. The paragraph commencing "Seed of the fungus causing the disease, &c.," should have been printed under the heading "Loose Smut."

CARE OF EWES AT LAMBING-TIME.*

By N. A. Bowman, Sheep and Wool Expert.

The commencement of the lambing season brings onerous tasks to most sheep-breeders. The station-owner, with his stud flocks, spares no effort to secure the maximum results when valuable sheep are at stake. Those who farm on a smaller scale must also recognize their responsibility in this direction; every lamb saved will become an asset to the State, and farmers who in the past have followed haphazard methods should take a more serious view of the duties that lambing-time brings. In this article attention is directed to the work of handling breeding ewes during this critical period in the development of the flocks of the Commonwealth.

Correct Way.

Incorrect Way.

Crutching Sheep.

[Reproduced from *Farmers' Bulletin* No. 95 of New South Wales Department of Agriculture.]

Crutching.

One of the essentials necessary for increasing the percentage of lambs that will be reared is a more general practice of what is known as "crutching."

The breeding ewes should be crutched some three weeks or so before they commence to lamb. In handling them, great care should be exercised so as to lessen any danger of mishaps. When taking the ewe from the catching pen, she should on no account be carried by her fore-end; such action may cause her to lose her lamb. She should be led out of the catching pen, and, when placed on the crutching board, turned up very carefully. Much time and energy are wasted by handling sheep roughly. To turn a sheep up carefully and conveniently, place the left arm under the jaw and catch hold of the right cheek; then turn the head to the left and upwards; at the same time pass the right hand over the sheep and take hold of the left hind leg and pull

* Reprinted, at the request of several readers, from a previous issue of the *Journal*. Opportunity has been taken to make a few slight alterations and additions.

it with a forward motion towards the centre of the belly, and the sheep will fall gently on her rump and in just the right position to be crutched.

To do the work properly the whole of the crutch up around the tail head under the hind legs should be shorn. In some cases I have heard sheep farmers say that, where the country is carrying burr to any large extent, they find it pays to clean up in front of the thighs, also in front of the udder, so as to ensure that the lamb will have no difficulty in finding the teats.

Careful haidling cannot be over-stressed. There should be no sudden drop into the shorn-sheep-pens, and to prevent crushing, the ewes should be counted out when the pen is little more than half full.

Lambing Paddocks Desirable.

Ewes should not be excessively fat at lambing time: good strong store condition is the best. Where possible, special paddocks should have been spelled in order to furnish fresh clean pasture for the lambing ewes. On large station properties, where there are capable married men living on the run, it is the practice to reserve paddocks near their houses for the ewes. This enables the men to give them closer attention at the most critical time. It is advisable for one to go among them as much as possible just before lambing time in order to get them well accustomed to being rounded up and handled. They soon become quite used to the presence of the man who is looking after them, and will neither run away nor show any alarm at his approach. Only well broken, silent, and wideworking dogs should be allowed among the ewes. As sheep are, perhaps, the most nervous of all domestic animals, it is a great advantage to have them quiet before lambing, so that in the event of any requiring special treatment they are less likely to suffer from nervous shock. It is of the utmost importance that the ewes, during this period, should be healthy. To ensure this a good supply of salt or a lick should be available to them.

A lick made from the following ingredients is recommended by the Live Stock Division of the Department of Agriculture:—

60 lb. of salt.
30 lb. of bone flour.
5 lb. of sulphur.
3 lb. sul. of iron.
2 lb. Epsom salts.
3 oz. pot. iodine.

Care at Lambing Time.

The man whose task it is to look after the ewes should be out at daybreak, and look first to the sheep camp for any ewes which may be in difficulties. Sometimes a ewe that is extra timid may desert her lamb. Should one show signs of doing this, she ought to be tied down and the lamb laid at her head. It will not be very long before the mother will take kindly to her offspring, and she may then be let loose. Another good plan to meet such circumstances is to make a small yard with three hurdles, and place the ewe and the lamb therein; this method is especially suitable for smaller holdings.

Full attention must be given to each and every flock daily. Early morning and late evening are the best times to be among the ewes and

lambs. In the case of ewes that have not previously had a lamb, one should make it a practice to be among them three, or, perhaps, four times a day.

Hand Feeding Lambs.

When twins are born there is a liability of the mother losing sight of one of them. In a case of this sort the lamb can be saved by hand feeding. Young lambs can be reared in many different ways—some good and others bad. When lambs are first brought in they should each receive a very little cow's milk, to which warm water and also about half a small teaspoonful of castor oil has been added. For a few days they should be fed four or five times a day with milk and warm water, only two good tablespoonfuls being given at a time. Later three or four drinks daily will prove sufficient until such times as they are quite big and strong.

Young lambs suffer from cold, and should be kept warm at night.

The Marking of Lambs.

When the time arrives for marking and tailing, temporary yards made with stakes, wire netting and a few hurdles, should be erected alongside a fence in the paddock where the lambs and ewes are gathered for the purpose of marking. Great care should be taken to prevent rushing the lambs; it is very desirable that they should not be overheated. Where temporary yards are used it will lessen the risk of any deaths from tetanus or blood poisoning which frequently supervenes if the operation be carried out in filthy yards. If the sheep-yards are used, they should be quite clean. It is a wise precaution to disinfect them with some sheep-dip or other antiseptic.

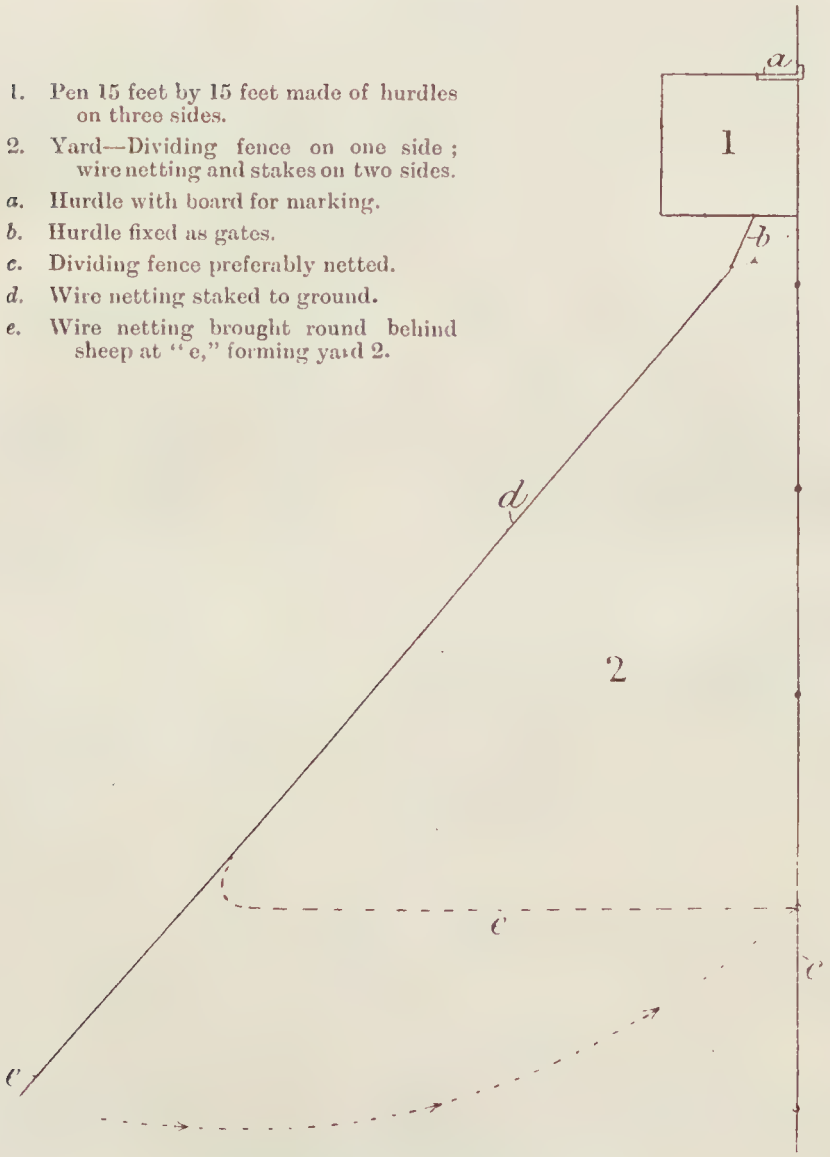
All knives and pliers required should be thoroughly cleaned and disinfected before marking is commenced, and frequently while they are being used, say, in a solution of one part carbolic acid to twenty parts of water. The catcher should rest the lamb on its hip bones on the top rail with its shoulders against either of his; he should catch the hind legs over the hocks and draw them forward between the lamb's forelegs and its brisket, and hold them there. The catcher generally calls the sex and presents the ear for marking, but the marker should verify the sex before he, with his pliers, snips the ear-mark in the left for males and in the right for females. In the marking of male lambs it is advised that the purse be tightly drawn by the fingers, and the end completely severed. Slitting the purse is far too tedious, and is not recommended in any circumstances. In tailing, never draw tails tightly, as the projecting bone will delay healing. Generally speaking, the tail is cut off at the second joint below the tail-head. Before it is actually cut the skin should be drawn back slightly towards the lamb's body by the man holding the lamb. Then when the lamb is released, the skin will overlap the end of the bone, and protect the flesh while healing is taking place.

The operator should throw the tails into two heaps as he cuts them off, males on one side, ewes to the other, so that an accurate count can be got of the number of each sex when the flock has been dealt with.

If the process of marking be carried out in a clean manner and the lambs placed on clean pasture after the operation, dressings are not necessary; as a matter of fact sticky dressings do more harm than good.

1. Pen 15 feet by 15 feet made of hurdles on three sides.
2. Yard—Dividing fence on one side; wire netting and stakes on two sides.

a. Hurdle with board for marking.
b. Hurdle fixed as gates.
c. Dividing fence preferably netted.
d. Wire netting staked to ground.
e. Wire netting brought round behind sheep at "e," forming yard 2.



Temporary Yard for Marking Lambs.
(Will hold 250 ewes and their lambs—scale, 1 inch equals 21 feet.)

NUT CULTURE.

By J. M. Ward, Superintendent of Horticulture.

Nut culture is a subject that has been sadly neglected, not only in Victoria, but throughout the whole Commonwealth.

As a proof of this—so far as it relates to Victoria—I shall quote the following statistics:—

The average production of almonds in Victoria during the past five years has been only 33 tons. During the same period, an average of 30 tons has been obtained from the other States, and 22 tons per annum from oversea countries. In addition to this, during the same time, some 350 tons of shelled almonds, that is, the kernels only, from countries beyond Australia were brought into Victoria. (The duty payable on all shelled nuts is sixpence per lb.)

Mention of the cost of almonds consumed in Victoria will probably surprise many. The annual value of those produced in Victoria during the past five years was £2,500; of those obtained from other States, £2,437; while the value of almonds grown beyond the Commonwealth, which were required to meet demands in Victoria alone during the last five years, is set down at £56,632 per annum.

Even greater quantities of walnuts were required. For the last five years the average annual production in Victoria has been about 17 tons, valued at £1,890. During the same period the quantity imported averaged 380 tons per year, valued at £63,766.

Though the yearly value of almonds and walnuts consumed in Victoria may be set down as £125,000, less than £4,500 of this amount is received by local growers.

In addition to walnuts and almonds, other nuts are used in considerable quantities, such as Brazil nuts and filberts. It can therefore be seen that nut culture in Victoria is an industry worthy of serious consideration, particularly in view of the fact that with the varied climatic and soil conditions to be found here, we are in the fortunate position of being able to produce a great variety of nuts.

Many growers look upon nut culture as less than a side line, whereas it should be given quite as much attention as, say, the production of dried vine fruits, apples, peaches, or any other main fruit crop.

Needless to state, care is required in the selection of site, locality, and soil, and the growing trees must be given every attention.

The Walnut.

The walnut must have a really good, rich, and well-drained soil; alluvial river flats that have a natural drainage are particularly suitable.

In the northern irrigation areas, care must be taken to see that trees are not planted upon salty soils. From observations made in other parts of the world—particularly California—it appears that the walnut is the most sensitive of trees to alkali injury.

It thrives in either a hot or a temperate climate. This is instanced by the large number of walnut groves in the hot districts of Southern California, and the fine growth and big harvests of trees in various parts of southern Victoria and Tasmania.

The growing of trees from seeds is a mistaken policy. Seedlings, even from trees yielding exceptionally good harvests, vary too greatly from the parent type to be of commercial value. Trees grown from seed

rarely bear nuts similar to those of the parent tree in form, size, thinness of shell, or plumpness of kernel, and still more rarely have they the productivity of the parent and other important characteristics that determine the commercial value of a tree. It is now recognized throughout the walnut-growing world that growers must rely upon the budded or grafted trees if success is to be attained.

The demand of planters in Australia for young trees, through lack of knowledge of the subject, has been responsible for many trees of unknown parentage being planted. Such, upon coming into bearing, usually prove to be unprofitable.

Success cannot be expected if ungrafted seedling walnut trees are planted. The stock mostly used in the past for budding and grafting was the black walnut (*Juglans nigra*); although, in California, during the last 20 years, the stock has been narrowed down to the Northern California Black Walnut (*Juglans hindsii*). This species will apparently withstand more unfavorable soil and climatic conditions than will the English walnut. It also appears to be fairly resistant to the root rot fungus (*Armillaria mellea*).

The reason why reference is made to California is because that State has something like 100,000 acres of walnuts under cultivation, from which some 2,250 tons of nuts are annually produced.

It is essential that every care be taken in harvesting the nuts. They should be carefully gathered, and dried or cured upon trays exposed to to the sun and wind. They should not be exposed to showers, fogs, or heavy dews. The alternate wetting and drying is harmful. Many Californian growers cure their walnuts in dehydrators.

The Almond.

The almond may be worked upon a number of different kinds of stock, such as the peach, apricot, plum, and the almond. Generally speaking, however, it appears to do best upon its own stock. It requires a soil even in texture and moisture. Where the soil varies in depth and character, the peach stock can be recommended.

The apricot and the plum are most unsuitable as a stock for almonds. A suggestion that is well worth considering, in the Goulburn Valley, for instance, is the working over to the almond of a number of peach trees of varieties that have been found unprofitable. The trees should be cut down, and almond buds worked on to the new growth.

What I said above regarding care in the harvesting and drying of walnuts applies even to a greater extent to the almond. Discoloured shells greatly reduce the value of nuts. Imported almonds are bleached; this gives the shell a nice, clean appearance. In California the bleaching is done by Almond Associations, which have special machinery for the purpose. They are thus able to produce a uniformly bleached product. The method in general consists of subjecting the nuts to a low steam pressure for from 10 to 20 minutes in order to moisten the shell. They are then exposed to sulphur fumes for from 10 to 30 minutes; one to three pounds of the best grade of flowers of sulphur is necessary to bleach 1 ton of almonds.

Conclusion.

I would like once more to impress upon prospective growers the desirableness of growing only good commercial varieties, and further, that when the trees are being planted, they should bear in mind the

necessity for cross fertilization. Again, I would remind growers that careful harvesting prevents discolouration of shells. Nuts should be graded for colour, size, and variety; graded nuts will realize from 20 to 30 per cent. more money than those ungraded. If I may give growers a slogan, it is:—"The market's here for nuts in shell; produce good nuts, and all is well."

THE FRAME HIVE.

By J. S. England, Apiary Inspector.

Most people without knowledge of bee-keeping, when a swarm of bees clusters in a place where they may be conveniently taken, will enthusiastically hive them in any box that may be available, and leave them there. Usually these hives produce very little honey, the result of queenlessness or disease due to neglect and the unworkable type of hive.

The advantages of the frame hive are so outstanding that no commercial apiarist would consider any other method of working bees. Even where one has only a few bees, I would strongly urge that they be kept on frames in a proper hive.

The production in Victoria last year from box hives averaged 6 lb. per hive, while during the same time the frame hive average was 48 lb. per colony, that is, just eight times the quantity of each box hive. In other words, it requires eight hives of bees in kerosene cases or boxes to give as much honey as one hive kept in frames. This great difference in production is mainly due to the accessibility, with its attendant advantages, of every part of the colony on frames as compared with one in a box.

When robbing a box hive, which is usually done only once a year, all the combs and brood are destroyed during the operation. This means that the colony has to commence all over again to establish itself, and the setback is so great that many colonies do not recover sufficiently to gather even enough honey for winter, and the consequence is that many bees die from starvation before spring time.

This would be avoided if the bees were kept in a frame hive. It is then an easy matter to examine the combs, and, when removing honey, leave a certain amount to keep the colony supplied over winter. Again, with frames, no brood need ever be removed, whereas with boxes it is all destroyed. This saving of brood is equal to about half the total strength of the colony, and it is the saving of this brood, as well as of the combs from which the honey has been extracted, that is such a big factor in the increased yield from the frame hive.

In a large portion of the State it is obligatory on those keeping bees to house them in frame hives, having straight combs in them. This regulation has been found necessary owing to the impossibility of effectively diagnosing and eradicating disease in the box hives.

What is the Frame Hive?

The frame hive originally invented by the Rev. L. L. Langstroth, of America, is the type in use in Australia to-day, and may consist of one or more hive bodies which are placed one above the other, each

body containing frames. Two sizes of body are obtainable—one to hold eight and one to hold ten frames.

Each hive is provided with a separate floorboard and cover, so that it can be enlarged at any time by the addition of another hive-body, or super as it is commonly termed.

These hives can be made by any one handy with tools. A leaflet explaining their construction is obtainable free from the Department of Agriculture. They may be purchased, whole or in parts, from W. J. and F. Barnes, Swan-street, Burnley; the Gippsland and Northern Co-operative Co., Melbourne; V. W. Benn, Sunshine; or from W. J. B. Johnson, Beaufort.

To get the maximum production from bees in the frame hive it is essential that all frames should be fitted with full sheets of comb foundation. This comb foundation consists of a sheet of beeswax cut to fit into the frame and stamped with the base of the worker cells. The frame is usually fitted with four horizontal wires which should be embedded in the foundation to further support it; the other ends of the wires should be attached to the top bar of the frame with hot beeswax.

The value of foundation is twofold: first, it is stamped with the base of the worker cells, which ensures that all comb built will be worker size, and, therefore, all bees raised in it will be workers. The raising of drones requires a larger cell. This control of reproduction is by far the greatest value of comb foundation, as it ensures the maximum working strength in the colony. The second advantage is that the fitting of combs with foundation ensures that they will be straight in the frames, and will be considerably stronger than if a starter only or no foundation at all were used.

How to Establish Bees in a Frame Hive.

For the beginner, the great difficulty is to get the bees successfully established in the frame hive.

In the case of the box-hive beekeeper, the transfer can be made at robbing time either by placing the bees direct on to the frames of foundation, or, if desired, it can be done at any other time when honey is coming in freely. All brood can be saved by tying it into empty frames, and placing in the new hive.

Another method of transfer is to have the frame-hive ready fitted at swarming-time, and, as the box-hives swarm, the swarms can be placed in the frame hive. In 21 days after swarming, the box-hive will contain practically no brood, and should then be robbed in the usual way, and the remaining bees placed on frames.

Should it be desired to carry out the transfer at any time without robbing the box, this can be done by inverting the box, and placing the frame hive on top of it. After the bees have established themselves on the foundation, the box-hive should be drummed to make the queen run up on to the frames, and then a queen excluder should immediately be inserted between the box and frame hives. If the queen is above the excluder there will be no brood remaining in the box-hive after 21 days, and the foundation may then be removed, and the honey and wax which it contains secured in the usual manner.

Where a commencement is made by purchasing swarms, these may be hived into frame-hives, but it is always advisable to place an empty

hive-body under the body containing frames so as to allow the bees to cluster temporarily until they build the comb foundation out. After a few days the empty body should be removed.

If the bees are all forced to cluster on the foundation when first hived their weight will frequently break it down, resulting in crossed and jointed combs, which are unworkable.

Once the bees are successfully established on one set of combs the question of super or upper stories has to be decided.

Where there are only one or two hives, and the purchase of a honey-extractor would not be justified, it is advisable to use half-depth supers. The shallow frames in these supers do not require wires in them to support the comb foundation, provided it is properly waxed to the top bars. When these frames are full of honey, it is a simple matter to cut the comb out, and replace with foundation to be again built out and filled. When removing these shallow combs of honey, it is advisable to leave at least one comb in the super to induce the bees to continue work there when the frames of foundation are returned.

When the first super of frames is given, and no built comb is available as a bait, the bees can be induced to commence work in the upper body by raising one of the combs from the lower body, and placing it in the shallow super after room has been made for it by the removal of a frame of foundation.

The objection to this method is that it leaves a space in the lower half of the bottom base, which must be filled by hanging a dummy board, cut to fit, from the bottom of the raised frame, otherwise the bees will build comb into this space, and this comb will have to be removed before the full depth comb can be returned to its original position, which should be done as soon as the bees are working on the foundation in the super.

Where several hives are kept, a honey-extractor should be secured. When honey is to be collected by an extractor, all supers should be of full depth, that is, of the same depth as the hive body itself. In such circumstances, it is a simple matter to induce the bees to occupy the super, as a frame of foundation from it can be replaced with a comb of brood from below, for the frames all being of the same size, are interchangeable.

When full, the honey can be easily removed from the combs by means of the honey-extractor and such of the combs as are not damaged in the process may then be returned to the bees to be refilled.

This saving of the combs means that the bees can very often refill them quickly and the apiarist may extract from them as often as six or seven times in the year as against the one robbing of the box hive.

Conclusion.

There is one bit of advice which I would like to emphasize—that is, never try to transfer bees to foundation except when honey is coming in freely, for they cannot build comb without wax, and they will not produce wax unless honey is being gathered.

The fact that there are still nearly 5,000 box hives in Victoria is evidence that many beekeepers have not yet realized the value of the frame hive, and of them I would ask—why not make your bees an asset in frame hives, instead of an eyesore in boxes?

BUDDING, GRAFTING, AND INARCHING OF FRUIT TREES.

By J. M. Ward, Superintendent of Horticulture.

In practically every fruit district in Australia, certain fruit trees have been planted which, at a later date, have been found unsuitable for the district; and in some cases a variety has been grown, for the produce of which there is little or no demand.

This has been much in evidence with certain varieties of peaches planted for canning purposes in the irrigated areas of Victoria and New South Wales.

Then, again, in the planting of many of the early apple orchards in Victoria and Tasmania, the then best known English varieties were planted for the British markets; but, at the present time, owing to the knowledge won by experiment, better keeping and shipping kinds are needed to replace such varieties as Ribstone Pippin, Mobb's Codling, Emperor Alexander, and others. The same thing applies to a lesser extent to pears and other fruits. There is also the question of working certain varieties amongst other kinds for pollination purposes. (See Bulletin No. 58).

To grub old but healthy and productive trees and to replace them with young ones is an economic waste, for it means unnecessary hard work and loss of time. Such trees as those in question can be easily and quickly changed over to more profitable kinds, by means of grafting or budding.

As to which are the best of the different kinds of fruit trees to grow has been, and always will be, a difficult problem to solve. With the peach, one has to consider the best kinds for canning, for drying, and for the fresh fruit markets; and with the apple, there is quality, colour, storage value, freedom from disease, and other qualities. Somewhat similar qualities are looked for in the pear, plum, prune, apricot, and citrus fruits; in fact, with all our fruits. No doubt the peach is the quickest to respond to the re-working over to another variety. Oranges and lemons also respond very quickly. With most trees, if the grafting and budding be successfully accomplished, the newly worked buds or scions make rapid headway so far as growth is concerned, for the whole of the sap from the well-established root system is concentrated upon developing these new growths.

The terms "stock," "scion," "bud-stick," "cambium layer," and "worked" will be referred to in this work, and they are thus defined—

1. *Stock.*—This is that portion of a tree—root or branch—on which a scion or bud is inserted.

2. *Scion.*—A portion of tree, usually one-year-old growth, containing one or more buds, and is that part which is grafted on to the stock.

3. *Bud-Stick.*—A part of the current season's growth from which buds are removed.

4. *Bud.*—A bud cut from a bud stick.

5. *Cambium Layer or Inner Bark.*—A thin layer of soft, greenish-coloured tissue situated between the bark and the wood. It is the growing part of the tree.

6. *Worked.*—The term "worked" is usually employed when the operation of inserting the bud or scion on to the stock has taken place.

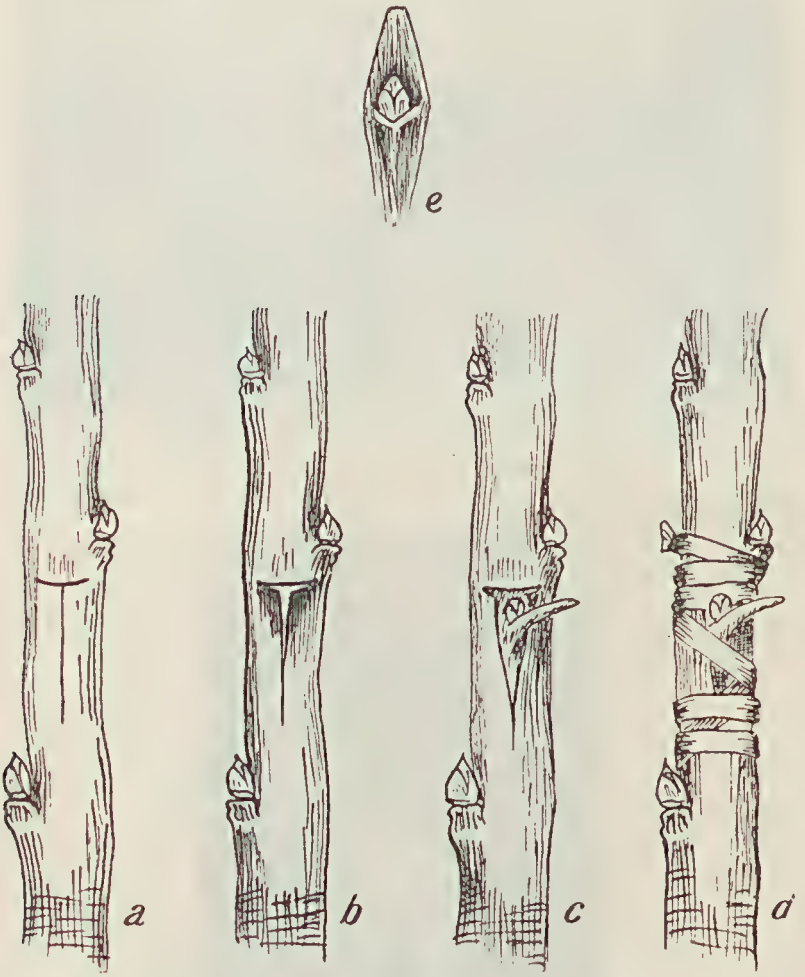


Fig. 1.—(*a*) T-shaped cut in the stock. (*b*) The bark raised ready to receive the bud. (*c*) The bud inserted for tying. (*d*) The job completed. (*e*) A well developed bud.

The several illustrations of grafting, &c., given in the following pages are to a large extent self-explanatory, and can be followed without very much description.

There are many methods of grafting in operation in various parts of the world, but only a few of these are put into practice where fruit trees are concerned. The commonest are—The Whip, or Tongue, or Cleft, the Saddle, the Rind or Bark, and the Strap grafts.

BUDDING.

There is practically only one method employed when budding fruit trees. There are, however, a few variations, but the fruit-grower is usually concerned with the one in general practice. This is shown in Figures 1 and 2. Some operators prefer the inverted T. Budding

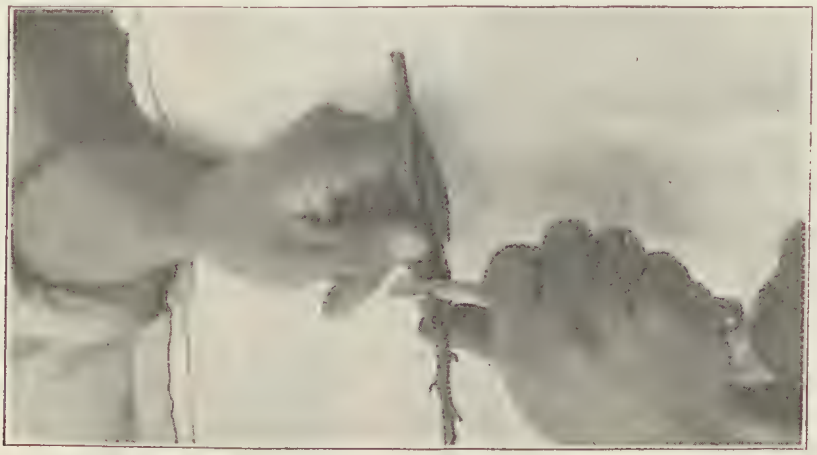


Fig. 2—Removing a bud from a bud stick.

Some budders prefer to remove the bud by commencing the cut from the top sid of the bud. In this instance the cut is made upward.

Fig. 3.—Spring growth from autumn buds.

This picture gives a close-up view of one of the young re-worked (budded) navel orange trees shown in Fig. 4. (Note where the old wood has been cut off above where the bud has started to grow.)

is performed on deciduous trees during the months of December, January and February, when the sap is running freely, and buds should be inserted on the current year's growth.

With citrus trees budding is done both during the autumn (March and April) and the spring (September and October).

The operation is a simple one, and with plenty of practice can be quickly performed. Only well-developed buds obtained from trees producing good quality fruit should be used.

Fig. 4.—Young "dud" Washington Navel Orange trees worked-over by budding to buds taken from trees that produced good quality fruits. The trunks were lime-washed with a view to protecting the bark from the heat of the sun.

Fig. 5.—An orange tree, 8 years old, showing the unions where the bud was inserted in the stock years before.

Care should be taken in removing the bud from the "bud-stick"; it should not be cut too deeply; the small portion of the wood that is cut with the bud should be removed from apricot, peach, and cherry

buds, but with apples, pears, plums, and citrus trees a thin portion may be allowed to remain with the bud. When removing the wood from any bud great care must be exercised in seeing that the small

Fig. 6.—A Whip Graft.

Fig. 7.—The same graft as shown in Fig. 6, but taken a year later. The union between stock and scion is very noticeable.

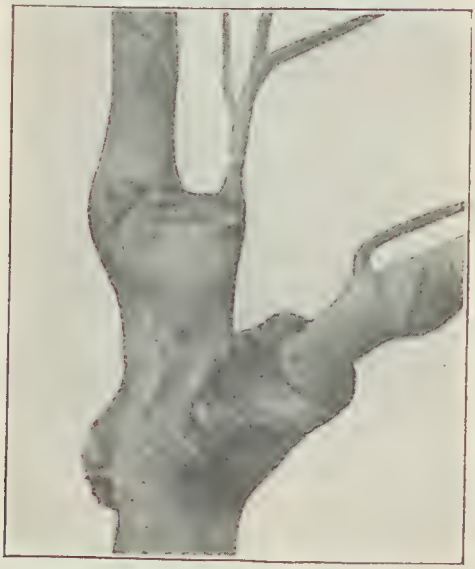


Fig. 8.—Showing where the saddle graft was made.
(Note the split in the wood and the unhealed parts of the stock. In such cases decay is liable to set up, and eventually the tree may smash down.)

Fig. 9.—Showing a graft where the scion has been placed on the upper part of the limb and has become stronger and stronger each year. Had it been inserted on the lower portion of the limb the graft would sooner or later break down under its own weight.

(Note how the "strap" of the scion is growing over the face of the cut.)

Fig. 10.—Another instance where the scion has been correctly placed on the upper part of the limb.

(The "strap" has almost completely grown over the cut face of the branch.)

pin-point of wood running to the eye of the bud is not removed, otherwise the bud will not "take." The stalk of the leaf is left on the bud; this acts as a handle when inserting the bud into place.

The bud is inserted just under the bark (next to the cambium layer) in a T-shape made in the stock, and is then securely tied with raffia or string. The bud is left in this condition until a good union results. The tie is then cut or loosened. The bud from a deciduous tree, or from the autumn-budded citrus, remains dormant until the following spring. (See Figures 3 and 4.) The citrus buds inserted in the spring will make growth the following summer. During the winter or spring months, the old wood is cut off just above the newly inserted bud (Fig. 3), and the new growth from the inserted bud becomes the future tree or main arm of the tree, as the case may be.

Fig. 11.—The Bark or Rind Graft.

(Note how the bark of the stock is curling away from the wood of the stock, owing to the wood dying. Compare this with the illustrations showing the strap graft. The result of the wood decaying is that the tree sooner or later breaks down.)

If budding over of old trees is desired, it is usual to cut the tree down during the dormant season; the buds are then inserted into the new spring growth that follows the hard cutting back; this is especially the case with citrus fruit trees.

Stone fruit trees should be budded during December or January; the sap is usually running more freely in such trees during those months than later on.

The budding of apples and pears can take place during January and February, and in some seasons as late as March, but January and February are the usual months for budding pome fruits.

To obtain successful results in budding, the following points should be observed:—

1. Use a very sharp knife; (2) use only well-matured buds; (3) bud when the sap is running well; (4) do not allow the sap on either

bud or stock to become dry or brown; (5) the tie should receive attention a few weeks after budding takes place; (6) six weeks or so after the bud commences to grow, the new growth may require attention by way of staking or pinching back to prevent damage by wind. Do not hesitate to give the required attention.

GRAFTING.

As previously stated, there are a number of ways of grafting, and those most commonly practised in Victoria are here described.

Fig. 12.—Robe de Sergeant Prune "top-worked" to apricot stock with the Rind Graft.
(Note decayed portion of trunk where grafting has been done.)

The Whip or Cleft Graft.

This method is employed when scion and stock are of somewhat similar dimensions, or in instances where the stock is twice the thickness as the scion. It is both simple and effective. From three to five main arms containing young growth are selected and a scion

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on each as follows:—Each limb is cut so that a long—1½ inches to 2 inches—smooth, slanting surface is obtained. This operation should be carried out by making one clean cut with a sharp knife.

The scion is then similarly treated and a small "tongue" made in the surface of both stock and scion (see Fig. 6). A union is made by bringing the cut surface together so that the two tongues fit into each other. Care must be taken to see that the cambium layers (inner bark) of both stock and scion come into close contact with each other, otherwise failure will result. The grafted portions are then tied tightly together with raffia or other suitable material, and the whole waxed over.

The Whip or Cleft Graft is used for young stock in the nursery to a greater extent than any other graft.

Fig. 13.—A close up view of the trunk of the tree shown in Fig. 12.

Saddle Graft.

This was practised to a more considerable extent some years ago than is done at the present time. It is used on limbs from 1 inch and upwards in diameter. The branches to be re-worked are cut ce of the cut, and the scion, which is nserted in this split in a manner that ie scion in close contact with the cam- graft is not recommended on account also because there are better methods

bium layer of the stock. of many faults that may in practice.

Whilst in a number of heal up the split stock sho never heals (see Fig. 1. takes place, and ve bud wi circle of the grafte

nces the scion grows vigorously enough e are many more instances where the Fungi enter this part of the stock and ten only a shell of sound wood on the b is left. (See Figures 12, 13, and 14.)

Although there are often more failures than successes with the Saddle Graft, the writer has seen some very good results from this method; nevertheless it is not recommended.

The Bark or Rind Graft.

This method, like the Saddle and Strap grafts, is employed for the re-working of trees having limbs an inch or more in diameter.

The tree which is to be worked over is cut down to about 6 to 12 inches above the crotch (where the main arms branch out from the trunk); selection is made of those parts which are in the best position to receive the scion (see Figures 9 and 10).

Fig. 14.—Result of allowing wood in a Prune Tree to decay. Strap grafting would have prevented this.

The scion is then prepared in a somewhat similar manner to the scion in the Whip Graft, but no tongue is made. A small portion of the bark at the opposite side of the cut may be removed; by doing this a better "take" is effected. Having prepared the scion, the bark on the stock is then prepared to receive the scion. This can be done in two ways. One is to make a simple straight cut with the point of the knife, about an inch or so in length down from the cut face of the limb; the bark is then gently eased away from the wood and the scion slipped in. The other way is to make two cuts in the bark about $\frac{1}{2}$ inch apart; the bark is then pushed away whilst the scion is put

in place. The latter method is probably the more successful of the two, particularly for the beginner.

In view of the great success that has been achieved with the Strap Graft, the Bark or Rind Graft, like the Saddle Graft, is not recommended. The failure of these grafts after they "take" is not noticeable for a number of years later. In many instances the scions fail to cover or grow over the face of the cut limb. This can be seen in Figure 11, and is further illustrated in Figures 12, 13, and 14.

Fig. 15.—Cutting the "strap" in scion ready for strap graft.
Note the bud near the end of the strap (the portion raised). It is wise to have a bud so placed.

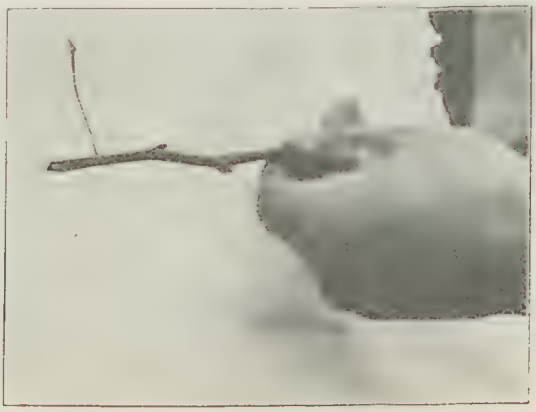

Fig. 16.—The scion for a strap graft prepared ready for grafting.

The Strap Graft.

For trees of similar size to those mentioned in the Bark Graft, or even for trees with limbs up to 6 inches in diameter, there is no better known method of grafting than the Strap Graft, so named from the "strap" which crosses over the cut surface of the limb. The scion is cut in such a manner that a strip of bark, together with a little wood attached (see Figures 15 and 16), is partly removed. This forms the "strap" as shown in Fig. 17.

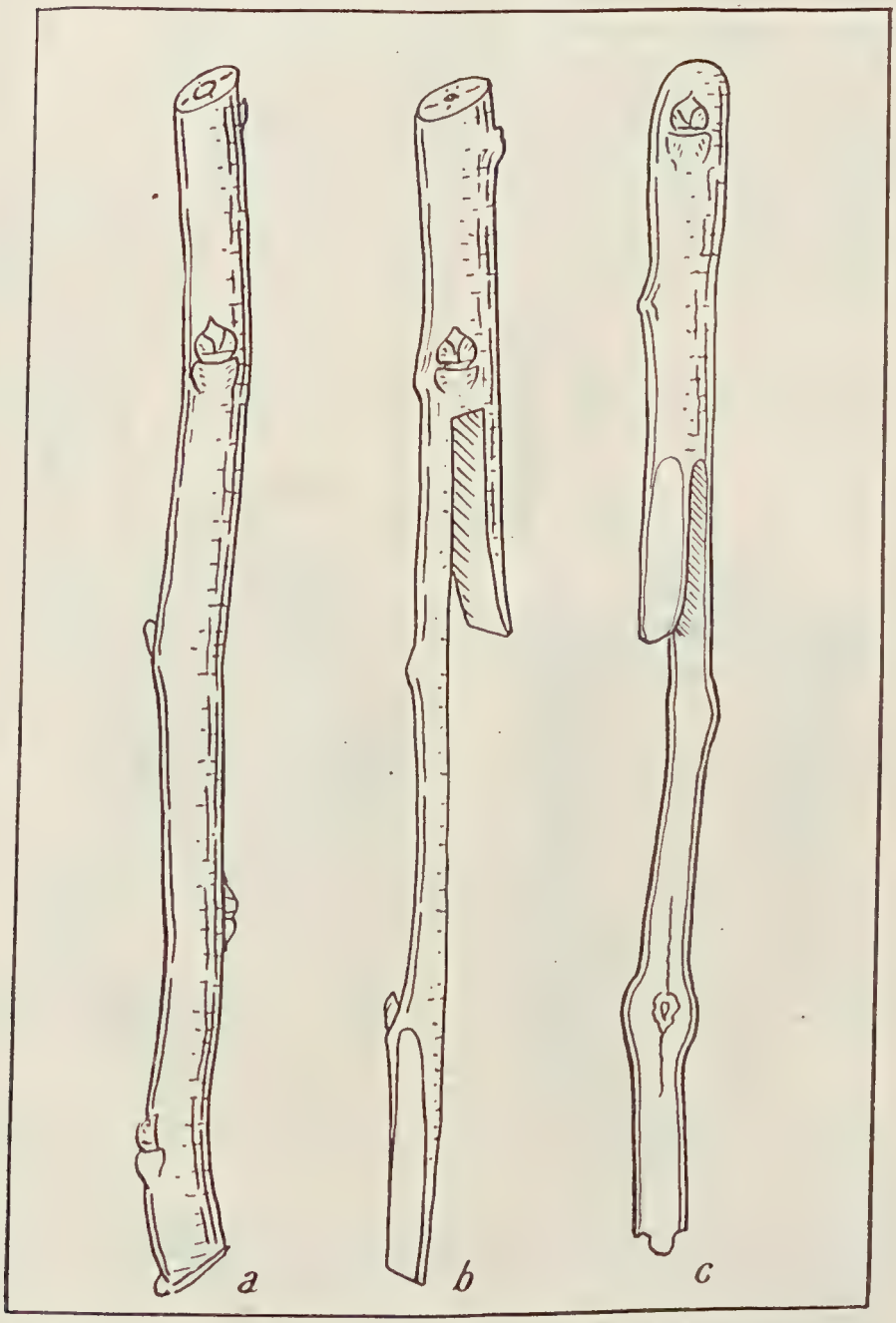

Fig. 17.—(*a*) The scion ready for preparation for the strap graft. (*b*) The same scion after preparation, showing small portions of bark removed from the back part of the "strap." (*c*) Another view of the scion showing where bark has been removed from another part of the scion.

The wood from which the cut has been made is then removed by making a slanting cut about 1½ inches long on the opposite side from that where the "strap" was cut. The length of the "strap" should be the diameter of the stock, plus about 1½ inches. The scion is then ready for insertion into the stock, which is prepared in the same manner as explained in the Bark Graft, with the addition that the bark is also cut and eased away from the opposite side of the stock from where the scion is placed, so as to allow the insertion of a portion of the "strap" into the stock (see Fig. 18). The whole is then securely tied and waxed. It is essential to carefully tie the "strap" hard down on to the surface of the cut. It will be found that the "strap" will quickly grow and cover over the cut. This is well

Fig. 18.—(a) The scion of the strap graft inserted ready for tying. (b) After tying and awaiting waxing.

illustrated in the various plates. Although the explaining of the Strap Graft takes some little time, the operation itself is quickly performed, and after a little practice any grower can quickly become an expert Strap grafter.

The Strap Graft has many advantages over any other graft for the "top-working" or "re-working" of established trees; one of the chief points is the rapid covering up of the cut surface of the stock, and thus decay in the stock is prevented. In addition to this there is more stability in a Strap-grafted tree than there is in a tree grafted by another method.

(To be continued.)

REGISTRATION OF STALLIONS.

NINTH ANNUAL REPORT

under the Horse Breeding Acts 1919 and 1925.

By E. A. Kendall, B.V.Sc., Chief Veterinary Inspector.

During the year 1928-29, 824 stallions were registered under the Horse Breeding Acts. Compared with the previous year, when 864 registrations were effected, this shows a further reduction in the number of stallions maintained in Victoria.

Of the total registered for the year under review, 587 were exempt under the provisions of the Horse Breeding Acts from further veterinary inspection prior to registration by reason of their having been inspected before each successive registration from the ages of three to five years inclusive.

The number submitted for examination was 237, which is 37 less than for the previous year. These were presented at 137 scheduled parades held throughout the State. These stallions comprised 201 draughts, 23 light, and 13 ponies.

Of the 201 draught stallions examined, 175 were certified for registration, and 26, or 12.93 per cent., were rejected. Unsoundness was responsible for 11, or 5.47 per cent., of these rejections, whilst the other 15, or 7.46 per cent., were deemed to be below a reasonable standard for stud purposes.

Sixteen of the 23 light stallions were registered, the other 7 or 30.43 per cent. being refused; 2 of them were unsound, and 5 below standard.

In the pony class, 2, or 15.38 per cent. of the 13 paraded for inspection, were rejected, both on the ground of being below standard.

A comparison with last year's figures shows a much lower percentage of rejections for the year under review, the total being 14.767 per cent. as against 20.43 per cent. for the year 1927-28, notwithstanding that the percentage of rejects in the case of light stallions is 30.433, compared with 19.34 per cent. for last year. The number of light stallions is small, however, so that the total percentage of rejects in all classes is not appreciably affected by the relatively high proportion of rejects in this class.

It is in the more numerous draught class that the lower percentage of rejections is shown, both in regard to unsoundness and disapproval as to standard.

It is difficult to find a complete explanation of this apparent improvement on last year's figures. Doubtless it is in some measure accounted for by the fact that there were 37 young stallions less submitted for examination this year, for it is in the first inspections carried out when stallions are in the third year of age that most of the rejections are met with.

Allowance must also be made for a natural tendency to reduction of unsound and unsuitable stallions by reason of a considerable number of rejected animals having been gelded during the past few years, or transferred to other States.

Unfortunately the influence of such action in reducing the number of unsound and unsuitable sires is nullified to some extent by some owners retaining other rejected stallions in the State for use on their own mares, as is allowed under the Amending Act of 1925.

In any case the reduction in the percentage of rejections recorded during the year 1928-29 is so marked that it will be a matter of more than usual interest to see whether it is maintained during the ensuing year's examinations.

The fact that the number of stallions registered has been steadily decreasing for some years past may be taken as an indication that the decline in the Horse Breeding Industry, more particularly in regard to draught horses, has not yet reached its limit.

No attempt will therefore be made to forecast whether there is any likelihood of a recovery and when it may be looked for.

Generally speaking, the law of supply and demand can be said to operate with horses as with commodities. The great difficulty is that it takes so long to produce the horse, for which there is still an undoubted demand. Dealers often find it difficult to fill orders for sound and serviceable heavy horses, which continue to command good prices.

The recent disposals of leading Clydesdale studs in Victoria is a matter of no little concern, for it affects the draught horse breeding industry in this State, especially as some of the best stallions and mares therefrom were purchased by buyers from other States. It is to be hoped, however, that this loss will be largely counteracted by the benefits that should accrue through the enterprise of other buyers, who will carry on breeding operations in this State with the new blood purchased at these sales.

Summary of Examinations.

1928-29.

——	Draught.		Light.		Pony.		Total.	
	Examined.	Certificated.	Examined.	Certificated.	Examined.	Certificated.	Examined.	Certificated.
	201	175	23	16	13	11	237	202
	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.
Bog Spavin ..	1	·497	1	4·347	..	..	2	·844
Bone Spavin ..	1	·497	..	..	..	..	1	·422
Cataract ..	..	..	..	..	..	..	..	..
Curb	..	..	..	..	..	..	..	..
Osteo Porosis ..	..	..	..	..	..	..	..	..
Ringbone ..	1	·497	1	4·347	..	..	2	·844
Roaring ..	..	..	..	..	..	..	..	..
Shivering ..	1	·497	..	..	..	..	1	·422
Sidebone ..	7	3·482	..	..	..	..	7	2·953
Stringhalt ..	..	..	..	..	..	..	..	..
Through unsoundness ..	11	5·470	2	8·694	..	..	13	5·485
Through disapproval ..	15	7·463	5	21·739	2	15·384	22	9·282
Total ..	26	12·933	7	30·433	2	15·384	35	14·767

SUMMARY OF EXAMINATIONS.
1927-28.

—	Draught.		Light.		Pony.		Total.	
	Examined. 219	Certificated. 174	Examined. 31	Certificated. 25	Examined. 24	Certificated. 19	Examined. 274	Certificated. 218
	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.	Rejected.	Per cent. Rejected.
Bog Spavin ..	..	..	..	..	..	..	..	..
Bone Spavin ..	..	..	2	6·45	2	8·33	4	1·46
Cataract ..	..	..	..	..	..	..	..	..
Curb	..	..	..	..	..	..	..	..
Osteo Porosis ..	..	..	..	..	..	..	..	..
Ringbone ..	2	·91	1	3·22	..	..	3	1·09
Roaring ..	..	..	..	..	..	..	..	..
Shivering ..	..	..	..	..	..	..	..	..
Sidebone ..	16	7·31	..	..	..	..	16	5·84
Stringhalt ..	2	·91	..	..	..	..	2	·73
Through unsoundness ..	20	9·13	3	9·67	2	8·33	25	9·12
Through disapproval ..	25	11·41	3	9·67	3	12·50	31	11·31
Total ..	45	20·54	6	19·34	5	20·83	56	20·43

Appeals.

Only two appeals were lodged against the decision of the Veterinary Officer during the year 1928-29. In one case for unsoundness, viz., sidebone, this appeal was upheld. The other a double one—unsoundness and disapproval—has not yet been decided.

Compensation under the Horse Breeding Act 1925.

In accordance with the provisions of the above Act, compensation was paid to six owners of stallions which, having been registered the previous year, were rejected at examinations in 1928-29 for unsoundness and subsequently castrated.

Parades for the Coming Season.

Owners of stallions are advised to study the schedule of parades on pages 306-311 for choice of centre to meet their convenience. Application should then be made on or before the 1st July, 1929, on the prescribed form for registration. Owners are reminded that, under the *Horse Breeding Act* 1925, it is now compulsory to forward with each application the sum of £3, being £1 registration fee and £2 compensation fee.

Veterinary officers will not necessarily attend any place specified in the schedule unless a notification is received that a stallion will be presented there for examination on the date and hour fixed in the schedule.

Forms of application may be obtained from secretaries of agricultural societies and from officers in charge of police stations, for whose assistance in this connexion the thanks of this Department are due.

Owners of stallions must bear in mind that change of ownership should be notified without delay in order that the certificate of registration can be suitably endorsed. A registration expires within 30 days unless the required notice is given.

The regulations under the amending Act are printed hereunder, and owners of stallions should make themselves acquainted with them.

STALLION PARADES.

TIME TABLE, 1929.

Provided that the applications for registration received indicate that a horse will be in attendance there for examination, a parade will be held at each of the following places:—

No. and Date.	Parade.	Time.	Officer Arrives.	Officer Departs.
Every Saturday from June 29 to December 14	Agricultural Offices	10 a.m.		
No. 1.				
Monday, July 1 ..	Maryborough	2 p.m. ..	12.30 p.m. ..	10.20 p.m.
Tuesday, July 2 ..	Mildura ..	10 a.m. ..	7.25 a.m. ..	8 a.m. (3rd)
Tuesday, July 2 ..	Carwarp ..	11.30 a.m.	Driving ..	Driving
Tuesday, July 2 ..	Werrimull ..	3 p.m. ..	Driving ..	Driving
Wednesday, July 3 ..	Ouyen ..	10.15 a.m.	10.12 a.m. ..	Driving
Wednesday, July 3 ..	Galah ..	11.15 a.m.	Driving ..	Driving
Wednesday, July 3 ..	Walpeup ..	11.45 a.m.	Driving ..	Driving
Wednesday, July 3 ..	Underbool ..	12.15 p.m.	Driving ..	Driving
Wednesday, July 3 ..	Boinka ..	1.30 p.m.	Driving ..	Driving
Wednesday, July 3 ..	Tutye ..	2 p.m. ..	Driving ..	Driving
Wednesday, July 3 ..	Cowangie ..	2.30 p.m.	Driving ..	Driving
Wednesday, July 3 ..	Murrayville..	3 p.m. ..	Driving ..	Driving
Wednesday, July 3 ..	Panitya ..	4 p.m. ..	Driving ..	Driving
No. 2.				
Monday, July 1 ..	Donald ..	4.30 p.m.	4.30 p.m. ..	4.50 p.m.
Tuesday, July 2 ..	Woomelang	10 a.m. ..	7.25 p.m. (1st)	10.50 a.m.
Tuesday, July 2 ..	Watchem ..	2 p.m. ..	12.39 p.m. ..	6.35 p.m.
Wednesday, July 3 ..	Birchip ..	10 a.m ..	7.10 p.m. (2nd)	1.23 p.m.
Wednesday, July 3 ..	St. Arnaud	3.30 p.m.	3.20 p.m. ..	7.4[illegible] a.m. (4th)
No. 3.				
Tuesday, July 2 ..	Sea Lake ..	10 a.m. ..	7.40 p.m. (1st)	9.50 a.m. (3rd)
Tuesday, July 2 ..	Nandaly ..	12 noon ..	Driving ..	Driving
Tuesday, July 2 ..	Culgoa (Railway Station)	3.30 p.m.	Driving ..	Driving
Wednesday, July 3 ..	Wycheproof (Railway Station)	12 noon ..	12 noon ..	12.25 p.m.
No. 4.				
Tuesday, July 2 ..	Charlton ..	11 a.m.	3.51 p.m. (1st)	1.43 p.m.
Tuesday, July 2 ..	Korong Vale	2.45 p.m...	2.45 p.m. ..	3.20 p.m.
Tuesday, July 2 ..	Boort (Railway Station)	4.20 p.m.	4.20 p.m. ..	4.50 p.m.
Wednesday, July 3 ..	Quambatook	9.30 a.m.	6.10 p.m. (2nd)	Driving
Wednesday, July 3 ..	Gredgwin (Railway Station)	10.30 a.m.	Driving ..	11.50 a.m.
Wednesday, July 3 ..	Inglewood ..	4.15 p.m.	4.15 p.m. ..	1.29 p.m. (4th)
Thursday, July 4 ..	Wedderburn (Railway Station)	2.35 p.m...	Driving ..	Driving
No. 5.				
Monday, July 8 ..	Mitiamo (Railway Station)	1.25 p.m.	1.25 p.m. ..	1.43 p.m.

Stallion Parades, Time Table—*continued.*

No. and Date.	Parade.	Time.	Officer Arrives.	Officer Departs.
No. 5—*continued.*				
Monday, July 8 ..	Pyramid	2.6 p.m. ..	2.6 p.m. ..	7.10 a.m. (9th)
Tuesday, July 9 ..	Raywood ..	11 a.m. ..	9.18 a.m. ..	12.50 p.m.
Tuesday, July 9 ..	Tandarra ..	1.5 p.m. ..	1.4 p.m. ..	4.42 p.m.
Wednesday, July 10 ..	Bendigo ..	11 a.m. ..	6.10 p.m. (9th)	3.15 p.m.
Wednesday, July 10 ..	Castlemaine	4.30 p.m. ..	4.5 p.m. ..	Driving
Thursday, July 11 ..	Shelbourne ..	10 a.m. ..	Driving ..	Driving
Thursday, July 11 ..	Eddington ..	11 a.m. ..	Driving ..	Driving
Thursday, July 11 ..	Baringhup ..	12 noon ..	Driving ..	Driving
Thursday, July 11 ..	Maldon ..	1.30 p.m.	Driving ..	Driving
Thursday, July 11 ..	Newstead ..	3 p.m. ..	Driving ..	Driving
No. 6.				
Monday, July 8 ..	Koondrook ..	4.45 p.m.	4.45 p.m. ..	11.30 a.m. (9th)
Tuesday, July 9 ..	Kerang ..	12.45 p.m.	12.45 p.m. ..	3.55 p.m.
Wednesday, July 10	Piangil ..	9.30 a.m.	Driving ..	Driving
Wednesday, July 10	Bannerton ..	1.30 p.m.	Driving ..	Driving
Wednesday, July 10	Manangatang	4 p.m. ..	Driving ..	Driving
Thursday, July 11 ..	Chillingollah	10 a.m. ..	Driving ..	Driving
Thursday, July 11 ..	Ultima ..	1 p.m. ..	Driving ..	Driving
Thursday, July 11 ..	Swan Hill ..	4 p.m. ..	Driving ..	9.30 a.m. (12th)
No. 7.				
Tuesday, July 9 ..	Dimboola ..	10 a.m.	6.10 p.m. (8th)	11.30 a.m.
Tuesday, July 9 ..	Lorquon (Railway Station)	3 p.m. ..	3 p.m. ..	3.5 p.m.
Tuesday, July 9 ..	Yanac (Railway Station)	4.50 p.m.	4.50 p.m. ..	Driving
Wednesday, July 10	Kaniva ..	10 a.m. ..	Driving ..	12 noon
Thursday, July 11 ..	Rainbow ..	1.30 p.m.	12 noon ..	Driving
Thursday, July 11 ..	Yaapeet ..	12.30 p.m.	Driving ..	Driving
No. 8.				
Monday, July 8 ..	Rupanyup ..	4.40 p.m.	4.40 p.m. ..	5 p.m.
Tuesday, July 9 ..	Marnoo ..	9.30 a.m.	6.25 p.m. (8th)	10.50 a.m.
Tuesday, July 9 ..	Stawell ..	2.33 p.m. ..	2.33 p.m. ..	7.35 p.m.
Wednesday, July 10	Ararat ..	10 a.m. ..	8.35 p.m. (9th) ..	Driving
Wednesday, July 10	Avoca ..	11.15 a.m.	Driving ..	Driving
No. 9.				
Tuesday, July 9 ..	Alexandra ..	2 p.m. ..	12.33 p.m. ..	4.35 p.m.
Wednesday, July 10	Yea ..	9 a.m. ..	6.25 p.m. (9th)	10.25 a.m.
Wednesday, July 10	Mansfield ..	2 p.m. ..	1.40 p.m. ..	3.30 p.m.
Thursday, July 11 ..	Kilmore ..	9 a.m. ..	9.30 p.m. (10th)	9.40 a.m.
No. 10.				
Tuesday, July 16 ..	Hopetoun ..	10 a.m. ..	8.50 p.m. (15th)	7.20 a.m. (17th)
Tuesday, July 16 ..	Patchewollock	12 noon ..	Driving ..	Driving
Tuesday, July 16 ..	Speed ..	3 p.m. ..	Driving ..	Driving
Wednesday, July 17 ..	Warracknabeal	10 a.m. ..	10 a.m. ..	6.5 p.m.
Thursday, July 18 ..	Beulah ..	9.30 a.m. ..	7.40 p.m. (17th)	12.5 p.m.
Thursday, July 18 ..	Minyip ..	3.15 p.m. ..	3.10 p.m. ..	11.45 a.m. (19th)
Friday, July 19 ..	Murtoa (Railway Station)	12.35 p.m.	12.35 p.m. ..	1.10 p.m.

STALLION PARADES, TIME TABLE—*continued.*

No. and Date.	Parade.	Time.	Officer Arrives.	Officer Departs.
No. 11.				
Monday, July 15 ..	Tungamah ..	1.30 p.m...	12.49 p.m. ..	9.9 p.m.
Tuesday, July 16 ..	Yarrawonga	11 a.m. ..	9.42 p.m (15th)	2.45 p.m.
Tuesday, July 16 ..	Goorambat (Railway Station)	4.20 p.m.	4.20 p.m.	Driving
Wednesday, July 17..	Benalla ..	9.30 a.m.	Driving (16th)	11.25 a.m.
Wednesday, July 17..	Rutherglen	2 p.m. ..	1.53 p.m. ..	7.40 a.m. (18th)
Thursday, July 18 ..	Barnawartha	2 p.m. ..	1.25 p.m. ..	3.28 p.m.
No. 12.				
Tuesday, July 16 ..	Natimuk ..	10 a.m. ..	6.55 p.m. (15th)	11.30 a.m.
Tuesday, July 16 ..	Goroke ..	1.15 p.m.	1.15 p.m. ..	6 p.m.
Tuesday, July 16 ..	Edenhope ..	3.30 p.m.	Driving. ..	Driving
Wednesday, July 17..	Horsham ..	9 a.m. ..	9.5 p.m. (16th)	12.10 p.m.
No. 13.				
Monday, July 15 ..	Wallace (Railway Station)	10.35 a.m.	10.30 a.m. ..	11.34 a.m.
Monday, July 15 ..	Ballan ..	12.2 p.m.	12.2 p.m. ..	Driving
Monday, July 15 ..	Bacchus Marsh	2 p.m. ..	Driving ..	Driving
Monday, July 15 ..	Melton ..	4 p.m. ..	Driving ..	8.45 p.m.
Tuesday, July 16 ..	Euroa ..	10.24 a.m.	10,24 a.m. ..	11.7 a.m.
Tuesday, July 16 ..	Seymour ..	1 p.m. ..	12.5 p.m. ..	6.1 p.m.
Wednesday, July 17..	Wangaratta	9 a m. ..	8.24 p.m. (16th)	Driving
Wednesday, July 17..	Moyhu ..	2 p.m. ..	Driving ..	Driving
Thursday, July 18 ..	Beechworth	2 30 p.m.	2.30 p.m. ..	3.3 p.m.
Friday, July 19 ..	Myrtleford ..	10 a.m. ..	Driving ..	Driving
No. 14.				
Monday, July 15 ..	Kyabram ..	12.15 p.m.	12 p.m. ..	Driving
Monday, July 15 ..	Tongala ..	3 p.m. ..	Driving ..	4.42 p.m.
Tuesday, July 16 ..	Tatura ..	9.30 a.m.	5.33 p.m. (15th)	11.28 a.m.
Tuesday, July 16 ..	Echuca ..	2 p.m. ..	1 p.m. ..	3.45 p.m.
Tuesday, July 16 ..	Rochester ..	4.30 p.m...	4.25 p.m. ..	9.15 a.m. (17th)
Wednesday, July 17..	Elmore ..	10 a.m. ..	9.35 a.m. ..	1.15 p.m.
Wednesday, July 17..	Cohuna ..	4 p.m. ..	3.50 p.m. ..	6.45 a.m. (18th)
No. 15.				
Monday, July 22 ..	Dookie (Railway Station)	12.45 p.m.	12.45 p.m. ..	1 p.m.
Monday, July 22 ..	Katamatite (Railway Station)	2.10 p.m.	2.10 p.m. ..	2.50 p.m.
Tuesday, July 23 ..	Nagambie (Railway Station)	9 a.m.	6.56 p.m. (22nd)	10.5 a.m.
Tuesday, July 23 ..	Shepparton..	Noon ..	11.20 a.m. ..	6 p.m.
Wednesday, July 24..	Numurkah ..	10 a.m. ..	6.55 p.m. (23rd)	12.24 p.m.
Wednesday, July 24..	Strathmerton	12.47 p.m.	12.47 p.m. ..	Driving
Wednesday, July 24..	Cobram ..	2.30 p.m.	Driving ..	3.30 p.m.
Thursday, July 25 ..	Nathalia ..	2 p.m. ..	1.32 p.m. ..	3.20 p.m.
Friday, July 26 ..	Murchison ..	9.30 a.m...	6. p.m. (25th) ..	10.58 a.m.
Friday, July 26 ..	Rushworth..	11.48 a.m.	11.48 a.m. ..	5.20 p.m.

STALLION PARADES, TIME TABLE—*continued.*

No. and Date.	Parade.	Time.	Officer Arrives.	Officer Departs
No. 16.				
Monday, July 22 ..	Tallangatta ..	4 p.m. ..	3.53 p.m. ..	Driving
Tuesday, July 23 ..	Corryong ..	12.30 p.m.	Driving ..	Driving
Wednesday, July 24 ..	Wodonga (Railway Station)	12.50 p.m.	12.50 p.m. ..	3.5 p.m.
No. 17.				
Tuesday, July 23 ..	Casterton ..	10 a.m. ..	7.40 p.m. (22nd)	Driving
Tuesday, July 23 ..	Coleraine ..	3 p.m. ..	Driving ..	Driving
Wednesday, July 24	Branxholme	10.47 a.m.	10.47 a.m. ..	11.55 a.m.
Wednesday, July 24	Hamilton ..	2 p.m. ..	12.30 p.m. ..	6.22 p.m.
No. 18.				
Tuesday, July 23 ..	Portland ..	10 a.m. ..	7.50 p.m. (22nd)	9 a.m. (24th)
Wednesday, July 24	Heywood ..	10.10 a.m.	10.10 a.m. ..	10.20 a.m.
No. 19.				
Tuesday, July 30 ..	Colac ..	10 a.m. ..	8.21 p.m. (29th)	11 a.m.
Tuesday, July 30 ..	Beech Forest	2.20 p.m. ..	2.20 p.m. ..	2.50 p.m.
Wednesday, July 31 ..	Winchelsea ..	10 a.m. ..	7.50 p.m. (30th)	11.14 a.m.
Thursday, August 1 ..	Lara ..	12.20 p.m.	12.16 p.m. ..	2.49 p.m.
No. 20.				
Monday, July 29 ..	Port Fairy ..	4 p.m. ..	2.45 p.m. ..	Driving
Tuesday, July 30 ..	Koroit ..	11 a.m. ..	Driving ..	Driving
Tuesday, July 30 ..	Hawkesdale	1.30 p.m.	Driving ..	2.40 p.m.
Tuesday, July 30 ..	Penshurst ..	3 p.m. ..	Driving ..	Driving
Wednesday, July 31 ..	Warrnambool (Railway Station)	10 a.m. ..	Driving ..	Driving
Wednesday, July 31	Terang ..	2.30 p.m.	Driving ..	Driving
Wednesday, July 31	Mortlake ..	3.30 p.m. ..	Driving ..	Driving
Thursday, August 1	Camperdown	11 a.m. ..	5.40 p.m. (31st)	Driving
Thursday, August 1	Timboon ..	1.45 p.m. ..	Driving ..	Driving
Thursday, August 1	Cobden ..	4.5 p.m. ..	Driving ..	Driving
Friday, August 2 ..	Werribee ..	11.45 a.m.	11.45 a.m. ..	1 p.m.
No. 21.				
Tuesday, July 30 ..	Bannockburn	2 p.m. ..	1.34 p.m. ..	4.12 p.m.
Wednesday, July 31 ..	Vite Vite ..	2 p.m. ..	12.22 p.m. ..	4.37 p.m.
Thursday, August 1	Lismore ..	10 a.m. ..	5.14 p.m. (31st)	11.45 a.m.
Thursday, August 1	Westmere ..	2 p.m. ..	1.13 p.m. ..	3.52 p.m.
Friday, August 2 ..	Inverleigh ..	10 a.m. ..	Driving ..	Driving
Friday, August 2 ..	Geelong ..	2 p.m. ..	12.10 p.m. ..	5 p.m.
No. 22.				
Tuesday, August 6 ..	Royal Show Grounds	2 p.m.		

STALLION PARADES, TIME TABLE—*continued.*

No. and Date.	Parade.	Time.	Officer Arrives.	Officer Departs.
No. 23.				
Monday, August 12 ..	Daylesford ..	Noon ..	11.55 a.m. ..	2 p.m.
Tuesday, August 13 ..	Waubra ..	10 a.m. ..	Driving ..	Driving
Tuesday, August 13 ..	Linton ..	2 p.m. ..	Driving ..	Driving
Tuesday, August 13 ..	Skipton ..	3 p.m. ..	Driving ..	Driving
Wednesday, August 14	Clunes ..	11 a.m. ..	8.36 a.m. ..	1.40 p.m.
Wednesday, August 14	Creswick ..	2.30 p.m...	2.13 p.m. ..	Driving
Wednesday, August 14	Kingston ..	3.30 p.m...	Driving ..	Driving
Thursday, August 15..	Kyneton ..	10 a.m. ..	9.5 a.m. ..	Driving
Thursday, August 15..	Redesdale ..	2 p.m. ..	Driving ..	Driving
No 24.				
Monday, August 12 ..	Traralgon ..	11.55 a.m.	11.55 a.m. ..	12.10 p.m.
Tuesday, August 13 ..	Maffra ..	10 a.m. ..	1.30 p.m. (12th)	Driving
Tuesday, August 13 ..	Sale ..	2 p.m. ..	Driving ..	4.22 p.m.
Wednesday, August 14	Warragul (Railway Station)	10 a.m. ..	7.8 p.m. (13th)	10.55 a.m.
Wednesday, August 14	Dandenong..	12.30 p.m.	12.25 p.m. ..	6.57 p.m.
Thursday, August 15	Bunyip (Railway Station)	10 a.m. ..	9.44 a.m. ..	11.20 a.m.
No. 25.				
Tuesday, August 20 ..	Jeparit	3 p.m. ..	1.20 p.m. ..	4.5 p.m (21st)
Thursday, August 22	Nhill ..	3 p.m. ..	8.5 p.m. (21st)	1.9 a.m. (23rd)
No. 26.				
Monday, August 19 ..	Korumburra	11 a.m. ..	10.52 a.m. ..	Driving
Monday, August 19 ..	Leongatha ..	2.30 p.m...	Driving ..	11.28 a.m. (20th)
Tuesday, August 20 ..	Yarram ..	3.30 p.m...	2.35 p.m. ..	7 a.m. (21st)
Wednesday, August 21	Foster (Railway Station)	12 noon ..	8.4 a.m. ..	Driving
Wednesday, August 21	Stony Creek	2 p.m. ..	Driving ..	Driving
Thursday, August 22	Wonthaggi ..	11 a.m. ..	11 a.m. ..	Driving
Thursday, August 22	Anderson (Railway Station)	3 p.m. ..	Driving ..	4.25 p.m.
Friday, August 23 ..	Cranbourne..	9.30 a.m.	8.17 a.m. ..	10.44 a.m.
No. 27.				
Tuesday, August 20 ..	Mernda ..	11 a.m. ..	10.32 a.m. ..	1.34 p.m.
Wednesday, August 21	Lilydale ..	2 p.m...	1.59 p.m. ..	4.56 p.m.
Thursday, August 22	Romsey ..	11 a.m. ..	10.21 a.m.	Driving
No. 28.				
Tuesday, August 20 ..	Frankston ..	12.51 p.m.	12.51 p.m. ..	2.20 p.m.
Wednesday, August 21	Sunbury ..	11 a.m ..	7.38 a.m. ..	2.56 p.m.
Friday, August 22 ..	Ballarat ..	11.30 a.m.	11.8 a.m. ..	2.55 p.m.

STALLION PARADES, TIME TABLE—*continued.*

No. and Date.	Parade.	Time.	Officer Arrives.	Officer Departs.
No. 29.				
Tuesday, August 20	Orbost ..	9 a.m. ..	6.25 p.m. (19th)	10.55 a.m.
Tuesday, August 20 ..	Bairnsdale ..	2.30 p.m.	1.55 p.m. ..	Driving
Wednesday, August 21	Ensay South	11 a.m.	11 a.m. ..	11.10 a.m.
Wednesday, August 21	Omeo ..	3 p.m. ..	3 p.m. ..	6.25 a.m. (22nd)
No. 30.				
Wednesday, Sept. 18	Royal Show	10 a.m.		
Thursday, Sept. 19 ..	Royal Show	9 a.m.		

REGULATIONS UNDER THE HORSE BREEDING ACTS.

1. *Interpretation.*—In the interpretation of these Regulations, unless inconsistent with the context or subject-matter—

"Act" means *Horse Breeding Act* 1919 (No. 3040), and *Horse Breeding Act* 1925 (No. 3406).

"Approved standard" means a standard which conforms to a reasonable standard in respect of type, conformation, and breeding.

"Certificate" means a certificate for the time being in force of registration under this Act.

"Chief Veterinary Inspector" means the Chief Veterinary Inspector of the Department of Agriculture.

"Inspection parade" means a parade of a stallion or stallions for the purpose of examination under this Act with a view to determining whether or not it or they is or are sound and of approved standard.

"Owner" means any owner (whether jointly or in severalty and whether absolutely or as lessee) or person in possession or charge of a stallion excepting for the purposes of the provisions of the Act with respect to compensation when "owner" means the owner of the stallion but does not include a lessee or person in possession or charge of any stallion.

"Prescribed" means prescribed by this Act or the regulations.

"Register" means the register of stallions kept in pursuance of this Act.

"Registered" means entered pursuant to this Act in the register.

"Registration" means registration for the time being in force under this Act.

"Regulations" means regulations made under this Act.

"Sound" means free from such diseases or defects as are deemed by the regulations to constitute hereditary unsoundness, and "soundness" has a corresponding meaning.

"Special inspection parade" means an inspection parade held at the request of the owner of the stallion.

"Stallion" means any male horse or donkey not wholly castrated and over the age of two years.

"Stud purposes" means mating with females for the purpose of procreation.

"Thoroughbred mare" and "thoroughbred stallion" means respectively a mare or a stallion entered in any prescribed stud-book or in the register kept by the association known as the Victorian Trotting and Racing Association.

"Veterinary Officer" means a veterinary surgeon in the employment of the Department of Agriculture.

2. Every owner of other than a registered thoroughbred stallion which is used for stud purposes with registered thoroughbred mares only shall on or before the first day of July in each year apply in writing to the Chief Veterinary Inspector to have such stallion registered, and with each such application shall forward a registration fee of Twenty shillings and a compensation fee of Forty shillings. The application shall be in the following form:—

APPLICATION FOR REGISTRATION OF A STALLION.

(*Horse Breeding Act* 1919.)
(*Horse Breeding Act* 1925.)

The Chief Veterinary Inspector,
Department of Agriculture,
Melbourne.

I(1).....hereby apply for registration of.....

my(2).....stallion(3).....for the period ending 30th June,(4).....19 , and I enclose herewith the sum of Three pounds (£3), being the amount of the Registration fee One pound (£1) and Compensation fee Two pounds (£2). I submit the following true particulars of the above-named stallion.

The stallion was bred by.....of.....and/or purchased by me from.....of.....

Date foaled.....

Sire..... { Sire's sire..... / Sire's dam.....

Dam..... { Dam's sire..... / Dam's dam.....

Signature.....

Postal address.....

Date.....

(1) Name of applicant.

(2) Class of stallion—draught, light, pony, thoroughbred.

(3) Name of stallion.

(4) If application is made after 31st March and before 1st July the "period" is to the 30th June in the following year.

3. Every owner shall submit his stallion or stallions to examination by a veterinary officer at an inspection parade arranged by the Chief Veterinary Inspector, excepting any stallion being five years of age or over registered under the Act or in respect of which a certificate has been refused, provided that—

4. When the owner of any stallion under five years of age has been notified that registration of such stallion has been refused because such stallion is not of approved standard he may by giving written notice elect to retain such stallion for a period of twelve months and then resubmit such stallion for registration.

5. Secretaries of agricultural societies or similar bodies shall make all necessary arrangements for inspection parades as required by the Chief Veterinary Inspector or by the veterinary officer conducting the examination. Where no such society exists a local police officer will notify owners who inquire of the arrangements made.

6. An owner who is or has been unable to submit his stallion for examination at an inspection parade may apply to the Chief Veterinary Inspector for a special inspection parade, and if the Chief Veterinary Inspector deem the reasons good and sufficient a parade may be arranged on the owner making payment, in advance, of the prescribed fee.

7. The fee for a special inspection parade shall be One pound (£1), together with the amount of railway fare (first class) from Melbourne to the place of examination and return.

8. (*a*) The following unsoundnesses are hereby declared to be hereditary unsoundness, the presence of any of which will constitute a reason for the refusal of a certificate of registration:—

Bog spavin.	Nasal disease (Osteoporosis).
Bone spavin.	Ringbone.
Cataract.	Roaring.
Chorea "shivering" or "nervy."	Sidebone.
Curb.	Stringhalt.
Navicular disease.	Thoroughpin.
	Whistling.

(*b*) A certificate will also be refused in the case of an animal considered by the examining veterinary officer to be below a reasonable standard as regards type, conformation, and breeding.

(*c*) For the purpose of these regulations "ringbone," "sidebone," and "curb" are defined as follows:—

(i) "Ringbone."—Any exostosis on the anterior or lateral aspect of the phalanges below the upper third of the Os Suffraginis shall constitute a ringbone.

(ii) "Sidebone."—Any ossification of the lateral cartilage shall constitute a sidebone.

(iii) "Curb."—Any circumscribed swelling on the posterior aspect of the hock in the median line and within the lower third of the limits of the hock and the head of the metatarsal bones shall constitute a curb.

9. An owner shall furnish the examining veterinary officer with such particulars concerning a stallion as the officer may require at the time of examination of such stallion (such as name, breeder, pedigree, age, prior ownership, &c.), and if the veterinary officer deem it necessary the owner shall furnish a Statutory Declaration in regard to such particulars.

10. The Chief Veterinary Inspector shall, in writing, notify the owner of any stallion in respect of which a certificate is refused within fourteen days of such refusal, and shall state in such notification the reason for refusal.

11. Until the issue of a certificate or the publication of the Register the result of an examination of a stallion by a veterinary officer shall not be communicated to any person except as herein provided or under circumstances as follow:—

The veterinary officer may, in his discretion, communicate to an owner or an owner's agent duly authorized in writing to inquire the result of examination of such owner's stallion or stallions.

The reason for refusal of a certificate shall not be communicated to any person except the owner concerned or his agent duly authorized in writing, save under the direction of the Court in legal proceedings.

12. The certificate of registration shall be in the following form:—

VICTORIA.

Horse Breeding Acts 1919 and 1925.

Certificate of Registration.

Issued in respect of the (1).....stallion(2).....
owned by (3).....of(4).....the above-named stallion,
which was submitted to veterinary examination at(5).....
on(6).....and declared free from hereditary unsoundness,
may be used for stud purposes until the 30th June, 19 .

.....Chief Veterinary Inspector.

Department of Agriculture, Melbourne.

(1) Class.

(2) Name, age, and description.

(3) Owner's name.

(4) Owner's address.

(5) Place of examination.

(6) Date of examination.

13. The certificate of registration shall remain in force until the 30th day of June next following the date of issue: Provided that a certificate issued in respect of a registration made not more than three months before the 30th day of June in any year shall remain in force until the 30th day of June in that year and for twelve months thereafter.

14. An owner shall forthwith, in writing, notify the Chief Veterinary Inspector of the death or castration of his stallion, and shall with such notice return the certificate issued in respect of such stallion.

15. An owner shall forthwith, in writing, notify the Chief Veterinary Inspector of the sale or change in ownership of his stallion, and shall with such notice forward the certificate issued in respect of the stallion concerned, together with the name and address of the person to whom ownership is transferred. The Chief Veterinary Inspector shall thereupon endorse on the certificate the transfer of ownership and forward it to the person who has become the owner, and unless in such circumstances a certificate is so endorsed within one month after change of ownership the registration and the certificate shall be deemed to be cancelled.

16. An owner may, on payment of a fee of Twenty shillings, obtain a copy of the certificate of registration of his stallion, which copy, if endorsed as such by the Chief Veterinary Inspector, shall be deemed a certified copy.

17. An owner or person in charge of a registered stallion shall, on demand by

(*a*) the owner or person in charge of a mare to be served; or by

(*b*) a veterinary officer in the employment of the Department of Agriculture, or any officer authorized, in writing, by the Minister; or by

(*c*) a member of the Police Force,

produce the certificate of registration issued in respect of his stallion or the certified copy thereof for perusal.

18. (*a*) If the report of a veterinary officer shows that a stallion is not sound or is not of approved standard, the owner may apply, in writing, to the Chief Veterinary Inspector to have the stallion examined by an Appeal Board and such application shall be made within thirty days of date of notice of refusal of certificate.

(*b*) If the report of the veterinary officer shows that the stallion is not of approved standard the application for examination by an Appeal Board shall be accompanied by a certificate from the president and two members of the committee of the society which arranged the inspection parade at which the stallion was examined that in their opinion the stallion is of a standard which conforms to a reasonable standard in respect of type, conformation, and breeding, provided that if no such society were concerned in the examination a similar certificate from three equine judges of repute will be accepted.

19. Each application for examination by an Appeal Board shall be accompanied by a fee of not less than £4 and not more than £10 as is fixed.

20. An Appeal Board shall consist of the Chief Veterinary Inspector or his deputy, and

(*a*) where the veterinary officer's report shows that the stallion is not sound two members chosen from veterinary surgeons registered under the *Veterinary Surgeons Act* 1915, and one of such members may be nominated by the owner of the stallion and one by the executive of the body known as the Chamber of Agriculture; or

(*b*) where the veterinary officer's report shows that the stallion is not of approved standard two members chosen from a panel of competent persons appointed by the Minister to be members of such panel; and one of such members may be nominated by the owner of the stallion and one by the executive of the said body. No person who has already examined the stallion and expressed any opinion based on such examination shall be a member of an Appeal Board.

21. The stud-books prescribed for the purpose of the Acts are the Australian Stud-Book and the Register kept by the Victorian Trotting and Racing Association.

22. The owner of any stallion, the registration of which has been refused, may retain such stallion for breeding purposes with his own mares only, on payment of a fee of Twenty shillings and notification in the following form:—

NOTIFICATION TO RETAIN A STALLION WHICH HAS BEEN REFUSED REGISTRATION.

Horse Breeding Act 1925.

The Chief Veterinary Inspector,
Department of Agriculture,
Melbourne.

I,(1).....owner of the(2).....stallion(3).....for which a certificate of registration has been refused, desire to retain such stallion for breeding purposes with my own mares only, and enclose herewith the sum of One pound (£1) being the amount of the prescribed fee for the period ending 30th June, 19 (4) I submit the following true particulars of the above-named stallion.

Date foaled.....

Sire..... { Sire's sire..... / Sire's dam.....

Dam..... { Dam's sire..... / Dam's dam.....

Signature.....

Postal address.....

Date.....

(1) Name of applicant.
(2) Class of stallion—draught, light, pony, thoroughbred.
(3) Name of stallion.
(4) If application is made after 31st March and before 1st July the "period" is to the 30th June in the following year.

23. The owner of any stallion for which a certificate of registration has been refused, which stallion was registered for the period ended 30th June prior to such refusal, may obtain compensation to the extent provided for in the Act on submitting evidence satisfactory to the Chief Veterinary Inspector that the stallion has been completely castrated.

GRADE STANDARDS FOR DRIED PRUNES.

Regulations for the grading of dried prunes into eight grades have recently been introduced by the New South Wales Department of Agriculture. These grades provide that the number of prunes per pound weight of fruit may vary to the extent of ten prunes per pound. The first grade (largest prunes) may range from 20 to 30 prunes per pound, and so on, up to 80 to 90 for the smaller sizes. Packages containing fruit smaller than the 80 to 90 size must be marked "small." A margin of not more than 5 per cent. by count is allowed in the grades of fruit from the grades immediately below and above such grade. Fruit in any one package must be of one variety and grade, and of uniformly good dark colour for each of the grades. The name and address (including the name of the State) of the person, or firm, or the name and registered office of the corporation by whom, or by which the fruits were packed; the name of the variety, and the grade of the fruit must be branded on each package. The New South Wales Department has asked the Victorian Department of Agriculture to give the widest publicity to this matter, so that persons consigning dried prunes to New South Wales may be made aware of their obligations under the regulations.

PLANTING AND RECONSTITUTION OF VINEYARDS.

Conditions Governing the Distribution of Phylloxera-Resistant Vine Rootlings and Cuttings.

The conditions subject to which Victorian vine-growers may purchase phylloxera-resistant vine cuttings and rootlings (grafted and ungrafted) from the State Vine Nursery, at Wahgunyah, have been drawn up for the current year, and copies of same are available on application.

Beyond certain alterations of dates, the conditions are much the same as for last season. There is no alteration in price.

DATES BEFORE WHICH APPLICATIONS MUST BE MADE.

For Grafted Rootlings (1930 distribution, June to August inclusive) applications will be received until 31st May. (For the 1929 distribution, the time for receiving applications closed on the 31st May, 1928, and present applicants cannot be supplied until 1930.)

For Ungrafted Rootlings, to be distributed from July to August, 1929, inclusive, applications will be received until 30th June, 1929. After these dates applicants can be supplied only in the event of there being a surplus, after all regular applications have been satisfied.

Applicants are required to finally decide, when filling in their application forms, as to their stock and scion requirements; no amendment can be permitted later.

PRICES.

It will suffice here to explain that resistant vines are supplied to intending planters in any of the following forms, and at the prices stated; packing extra, in the case of consignments forwarded by rail:—

Resistant rootlings, grafted with scions previously supplied by applicants, at per 1,000, £12 (Deposit, 30s. per 1,000).

Resistant rootlings, ungrafted, at per 1,000, £3 (Deposit, 15s. per 1,000).

Resistant cuttings, at per 1,000, £1 10s.

APPLICATION FORMS.

No application will be entertained unless made on the forms supplied for the purpose, which are obtainable from the Horticultural Superintendent, Department of Agriculture, 605 Flinders-street, Melbourne, or from the Manager, Viticultural Station, Rutherglen.

Separate forms are provided for (*a*) Grafted Rootlings; (*b*) Ungrafted Rootlings and Cuttings. Applications must be filled in on the proper forms, and accompanied by a deposit as specified above.

Each applicant for forms will be supplied with a copy of the detailed conditions governing the distribution of phylloxera-resistant vine rootlings (grafted and ungrafted) and cuttings.

Applicants are earnestly requested to thoroughly familiarize themselves with these. *They are warned that under no circumstances can any departure be permitted from the regulations governing the distribution as detailed therein, nor can any request for special consideration be entertained.*

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

Cultivation.

Cultivation work should be well on the way by this time. The ploughing should be advanced, so as to leave plenty of time for other orchard work. Autumn ploughing may be rough, but care should be taken to plough to the trees, so that a drainage furrow is left between the rows.

Manuring.

It is just possible, where heavy crops have been carried, that a top dressing of stable manure will be required to add humus to the soil. The fertility of the soil must be maintained; and, although stable and chemical manures as a general rule are of undoubted value as tree stimulants, well-cultivated and thoroughly tilled land will always carry fair crops with far less manure. Further, if the orchard land is well drained, cultivated, and sub-soiled, any manures that are used will be far more beneficial to the trees. The more suitable the conditions that are given to the trees, the better they can appreciate and assimilate their food.

Perhaps the most useful and valuable of manures is stable manure It is of great use, not only as a manure and as an introducer of necessary bacteria into the soil, but its value in adding humus to the soil is incalculable. Organic matter, such as stable manure, introduced into the soil quickly becomes humus; this greatly ameliorates and improves soil conditions. It is impossible to say what quantity of stable manure is necessary per acre; that can be determined only by circumstances. Orchards in different climates and varying soils will require differing quantities. A too liberal use of stable manure will be over-stimulating in most cases, and at all times an excess beyond what is necessary for present use will only be waste, as humus is readily lost from the soil, once it is in an available food form.

It has been pointed out in these notes previously that an improved physical condition is far more profitable to the fruit-grower than the continued use of manures. A tree will be far more productive if it is happy in its soil conditions; uncomfortable conditions will always result in unprosperous trees.

A dressing of lime, using about 4 or 5 cwt. per acre, is of great value in stiff or heavy orchard lands; and it may be given at this season. The lime, which must be fresh, should be distributed in small heaps between the trees, covered with a layer of soil, and allowed to remain for a few days before ploughing or harrowing in.

Pests.

The advice given last month for spraying should be followed, particularly where any oil emulsions or washes are to be used.

Orchards will benefit if an attack is now made upon the Codlin moth. All hiding places, nooks, and crannies, where the larvæ have hidden, should be thoroughly searched and cleaned out. The orchardist has far more time now to do this work than he will have in the spring time

General Work.

Drainage systems should now be extended with as little loss of time as possible.

New planting areas should be prepared, and sub-soiled or trenched wherever possible.

The Vegetable Garden.

Weeds must be kept down in the vegetable garden. Weeds are generally free growing at this season; their growth is very insidious, and they will crowd out the young seedlings or plants in a very quick time Hoeing and hand weeding must be resorted to, preferably hoeing. The frequent use of the hoe in winter time is of much benefit in the vegetable garden. A varied assortment of crops is now being produced; and if these can be kept growing much better crops will result. The soil quickly stagnates in the winter, and the only way to prevent this is to keep the surface stirred. Thus, a double service is performed with the aid of the hoe.

The application of lime is of great necessity at this season. In addition to amending unhealthy and unsuitable soil conditions, lime is particularly useful as an insecticide. It assists in destroying in immense numbers both eggs and insects that would breed and live in the ground ready to do damage to all classes of vegetable crops. Therefore, wherever possible, the soil should receive an application of lime. The garden should, as well, be manured with stable manure, but not for some weeks after the lime application.

Cabbage and cauliflower plants may be planted out; and seeds of parsnips, carrots, onions, peas, and broad beans may be sown.

The Flower Garden.

The whole flower section should now be thoroughly dug over. All beds should be cleaned up, top dressed with manure, and well dug. The light rubbish, such as foliage, twiggy growths, weeds, &c., may all be dug in, and they will thus form a useful addition to the soil. These should never be wasted. Only the coarser and stouter growths should be carted away for burning, and then the ashes may be used as manure. No part, whatever, of garden rubbish or litter need be wasted. In one form or another it should be replaced in the soil.

May is a good month for establishing new gardens, and for planting out. All deciduous plants and shrubs may now be planted. It is not necessary to dig a deep hole for planting. A hole in which the roots of the plant can be comfortably arranged, without crowding or cramping, will be quite sufficient for the purpose, the soil around being very well cultivated.

Continue to sow seeds of hardy annuals, including sweet peas, although the main crop of sweet peas should by this time be well above ground. Where there has been any overplanting, the young plants will

readily stand transplanting, and this will greatly assist those that are to remain. Annuals should not be crowded in the beds. They require ample room for suitable development, and thus the seeds should be sown thinly or the plants set out a good distance from each other.

All herbaceous perennials that have finished blooming may now be cut down. Included amongst these are phlox, delphiniums, &c. If these are to remain in their present situation for another season it is always an advantage to raise them somewhat, by slightly lifting them with a fork, so that too much water will not settle around the crowns; they may also be mulched with stable manure, or the manure may be forked into the soil around the crowns.

REMINDERS FOR JUNE.

LIVE STOCK.

Horses.—Those stabled and in regular work should be fed liberally. Those doing fast or heavy work should be clipped; if not wholly, then trace high. Those not rugged on coming into the stable at night should be wiped down and in half-an-hour's time rugged or covered with bags until the coat is dry. Old horses and weaned foals should be given crushed oats. Grass-fed working horses should be given hay or straw, if there is no old grass, to counteract the purging effects of the young growth. Old and badly-conditioned horses should be given some boiled barley. Paddocked horses should be looked at from time to time to ascertain if they are doing satisfactorily.

Cattle.—Give milking cows the advantage of either shelter or rugs. Rugs should be removed and aired on any sunny day, or when the temperature exceeds about 60 degrees. Use should now be made of the oat or other cereal crop, over 6 inches high, by grazing, if soil will stand it. Don't let cows remain on the crop after their appetites have been once satisfied. If soil "pugs," with tramping, it will be better to cut the green material and throw it over the fence to the animals. Try to keep the crop down below 9 inches; it is better for the crop itself and better for the cows. Under winter conditions, it is better that cold and watery fodder be somewhat limited, and the difference made up with some drier food, such as hay or chaff. Meet any falling yields that are due to the seasonal combination of checked growth and increased appetite, with hand-feed designed both to amplify and balance the paddock supply. Watch the falling yields and test out the efficacy of concentrate to profitably check them. Take warning at cows (either milking or dry) losing condition and feed them better. Keep the main herd away from the bull for a month longer, and serve only cows wanted for early autumn milking. Feed the bull well with balanced material to fit him for his coming heavy work. See that the calves have a grass paddock in which to exercise, a wind-break for shelter, and a well-drained spot, as dry as possible, on which to lie. Look to condition of yards and drainage, so that yards may be kept reasonably sanitary. Don't be tempted by cool weather to keep cream on farm over long; stale cream is never good cream.

Pigs.—Supply plenty of bedding in well-ventilated sties. Sows in fine weather should be given grass or lucerne run, and kept in good forward show condition. Bulletin on the Pig Industry is now available.

To get the best results, pigs should be bred and fed on the lines prescribed in articles printed in this *Journal* for May, June, July, August, September, and October of last year.

Sheep.—As June is the month in which the bulk of the lambs are dropped in Victoria, careful attention should be given to all flocks of lambing ewes. Two- and four-teeth ewes, particularly merino and fine-woolled crosses lambing to English rams, often have trouble. During the peak period of lambing, the flock-

owner should visit the paddock at least three times a day (early in the morning, midday for any special cases, and late evening are the best times), so that aid may be given to any young ewes that are having abnormal difficulty in parturition. It is not wise, of course, to disturb the flock unnecessarily at this stage, and sheep dogs should not be allowed to accompany the flock-master on his daily rounds.

It may be found advisable to induce the young ewe to take to her lamb immediately after birth; to help in this a small enclosure of stone, wood, or brick might be built in a convenient place; the ewe, with her lamb, should be put therein for a few hours; the result will usually prove worth the trouble.

Mark ram lambs as soon as possible; this can be done any time after a week from date of dropping, until all the ewes have lambed; they can be marked in batches as they become a few weeks old. A plan of temporary marking yard is included in this issue. A good idea is to construct temporary yards in the paddock made with stakes, wire-netting, and a few hurdles, so that the marked lambs can be dropped on to clean pasture.

Flocks of dry sheep should be attended to regularly, and, if necessary, crutched, the wool removed from around the eyes, hoofs pared, and treatment administered in case of worms, or flies, or foot-rot. Hoofs can be pared easily during the winter months; it should be remembered that overgrown hoofs are conducive to lameness, and even to foot-rot.

Stud sheep intended for exhibition should be given special feed from now on, and their wool looked to for general protection.

Foxes are more ravenous during the winter months. Sparrows, starlings, and parrots are good bait. Poisoning the carcasses of lambs usually accounts for scavenger foxes only. Powdered strychnine just sufficient to cover a three-penny piece is the usual dose to apply to a bait.

POULTRY.—Supplies of shell grit and charcoal should always be available. Sow a mixture of English grass and clover; this not only removes taint in soil but provides excellent green fodder for stock. Where possible, lucerne and silver beet should now be sown for summer feed; liver (cooked) and maize aids to egg production during cold weather. Morning mash should be mixed with liver soup given to the birds warm in a crumbly condition. All yards should be drained to ensure comfort for the birds.

CULTIVATION.

FARM.—Plough potato land. Land to be sown later on with potatoes, mangolds, maize, and millet may be dressed with stable manure and well worked. Sow malting barley and sow cereals. Lift and store mangolds, turnips, &c. Clean out drains and water furrows. Clean up and stack manure in heaps protected from the weather.

VINEYARD.—Thoroughly prepare for plantation, land already sub-soiled for the purpose. Remember that the freer it is kept from weeds from this forward, the less trouble will there be from cut-worms next spring. Applications for grafted resistant rootlings must be made before the end of May, those for ungrafted resistant rootlings and cuttings before the end of June—see note in current issue. Pruning and ploughing should be actively proceeded with. In northern districts plough to a depth of at least eight inches as early in winter as practicable. Manures should be applied as early as possible.

Cellar.—Rack all wines which have not been previously dealt with. Fortify sweet wines to full strength.

ORCHARD.—Finish ploughing; plant young trees; spray with red oil or petroleum for scales, mites, aphis, &c.; carry out drainage system; clean out drains; commence pruning.

VEGETABLE GARDEN.—Prepare beds for crops: cultivate deeply; practise rotation in planting out; renovate asparagus beds: plant out all seedlings; sow radish, peas, broad beans, leeks, spinach, lettuce, carrot, &c.; plant rhubarb.

FLOWER GARDEN.—Continue digging and manuring: dig all weeds and leafy growths; plant out shrubs, roses, &c.: plant rose cuttings; prune deciduous trees and shrubs; sow sweet peas and plant out seedlings.

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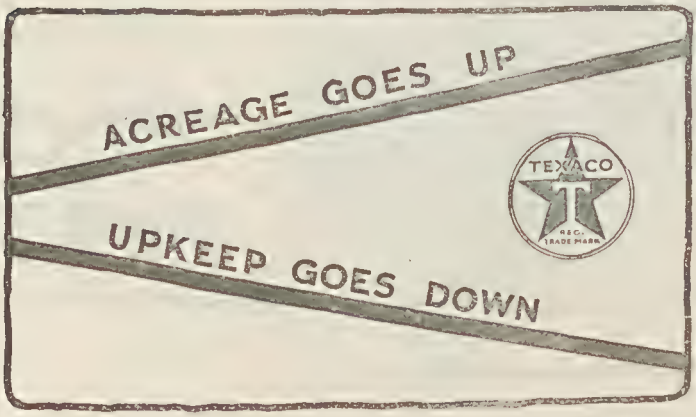

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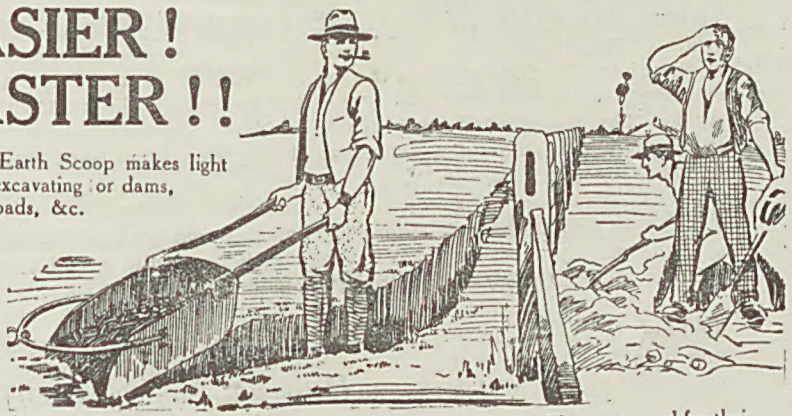

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